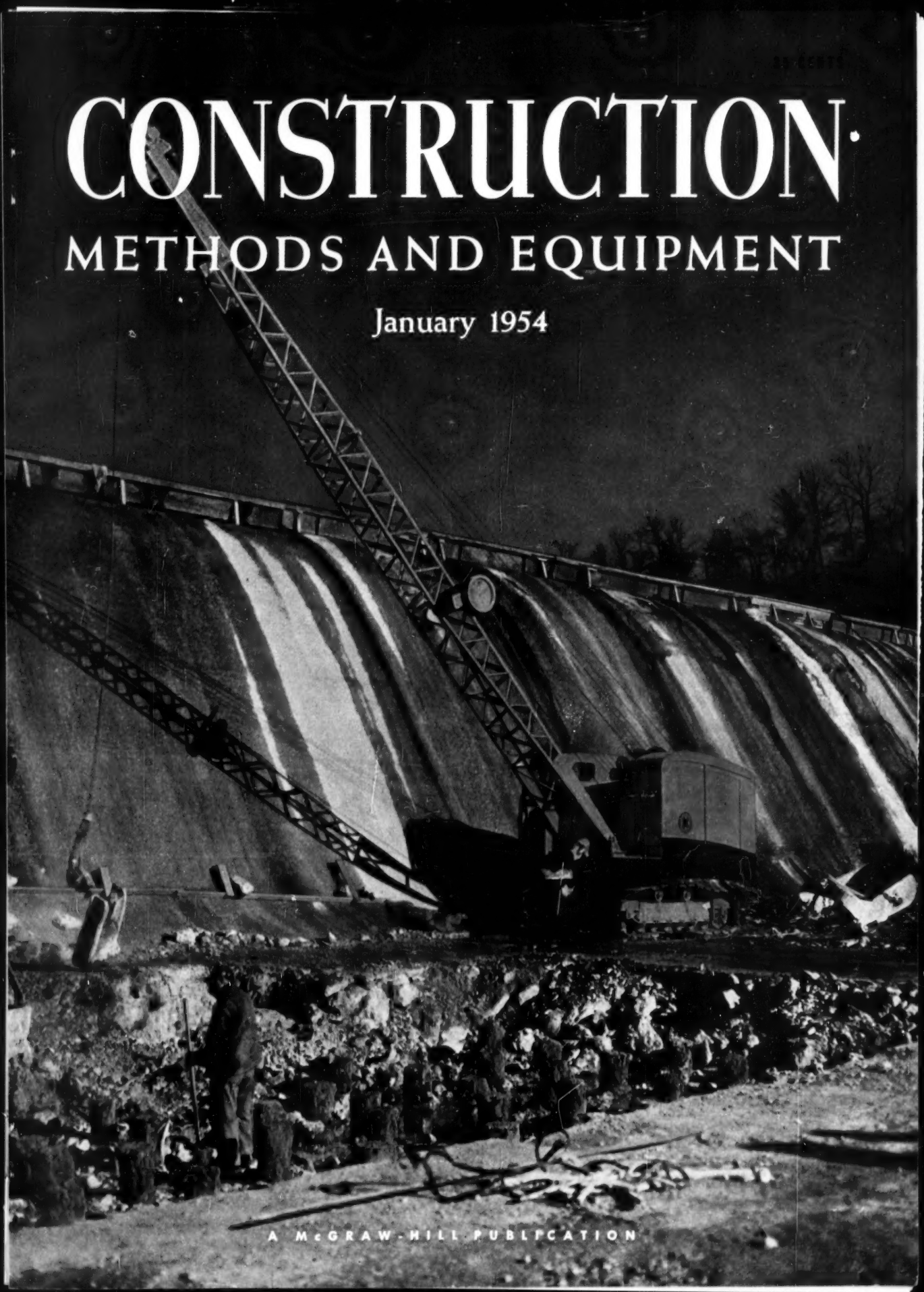
CONSTRUCTION METHODS AND EQUIPMENT

January 1954



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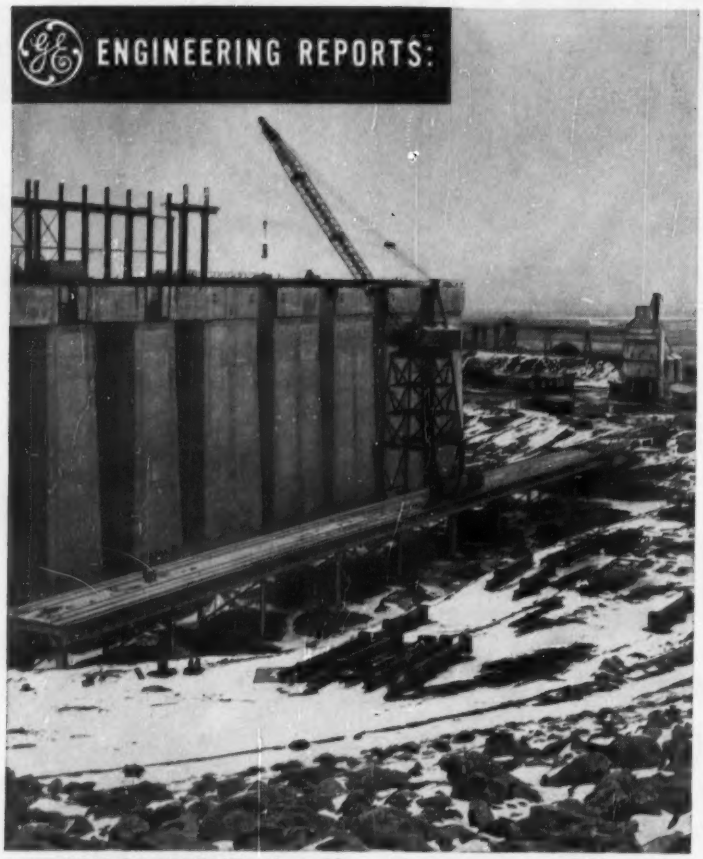
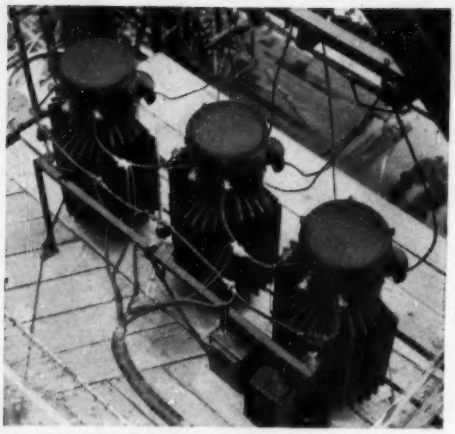
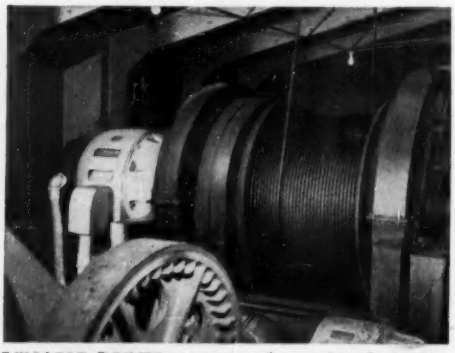
ENGINEERING REPORTS:



ELECTRICAL CO-ORDINATION provides continuous operation of this revolver crane 100 feet above the base of the huge intake structure. Movement along trestle is powered by a G-E 200-hp Type MR motor at foot of the gantry.



ADEQUATE POWER to maintain smooth, dependable crane performance is stepped down by these portable G-E transformers.



RELIABLE DRIVES must stand exacting demands of this revolver crane. G-E 200-hp motors and control are key to this application.

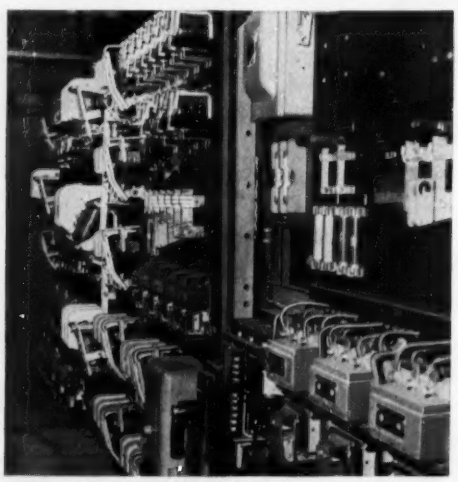
Electricity helps Garrison Dam keep round-the-clock schedule

G-E drives, still on the job after six years, are helping to harness Missouri River

At Garrison Dam near Bismarck, N. D., completely electrified equipment plays a vital role in keeping round-the-clock construction work on schedule. All electrical systems for the project's main stages were designed and co-ordinated by U. S. engineers, Peter Kiewit and Son Co., and Morrison-Knudsen Co. contractors—aided by G-E application engineering. This engineering teamwork resulted in maximum working capacity and fast, smooth operation.

Let G-E application engineers help *you* get the most from your construction equipment through electrification—from the smallest drive to the largest power distribution system. Contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, New York.

664-31



CENTRALIZED CONTROL equipment on this compact G-E panel is mounted in the cab for simple one-man operation.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

Rubber moves jaws that chew rocks by the ton

A typical example of B. F. Goodrich improvement in rubber

INSIDE that mass of metal are big jaws that chomp like human teeth. But it's *rocks* they bite and grind—2000 tons a day—for building concrete roads! The jaws are powered by rubber belts and every time they grip and grind a new batch of rock, you can imagine the jerking jar that hits those belts. They were being broken and torn to shreds in days.

Looking for ways to save, the contractor tried a kind of belt new to him—Grommet V belts—developed and made only by B. F. Goodrich. A grommet is a cord loop inside the belt. It is made like a giant twisted cable except that it's endless—no splices or overlaps. The grommets make it a flexible belt but one that stands shocks and heavy loads far better than ordinary belts. No other kind of belt has grommets; no other belt stands so much punishment or lasts so long.

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Grommet—T. M. The B. F. Goodrich Co.

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Volume 36
Number 1

CONSTRUCTION METHODS AND EQUIPMENT

Established 1919

January 1954

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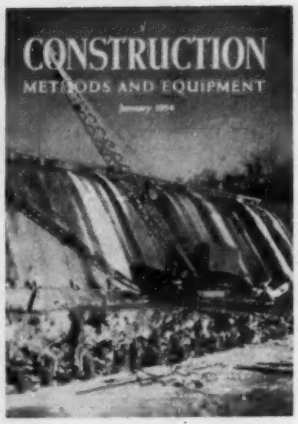

On the Cover . . .

Hammering away with a 1,500-lb skullcracker this Koehring 304 crane is breaking up the 5-ft concrete apron below Ford Plant Dam in Minneapolis. Drag bucket and clamshell are kept handy to clean out the area, make ready for new concrete. Otto B. Ashbach & Sons, St. Paul, were contractors for repairs to the dam on the Mississippi River.

CONSTRUCTION METHODS AND EQUIPMENT was founded in 1919, under the name of SUCCESSFUL METHODS, by the Manufacturers Publicity Bureau, Inc., of Chicago, representing a group of non-competing manufacturers of construction equipment. Charles B. Thomas, editor of the first few issues, was succeeded by William Jabine.

In 1926 the McGraw-Hill Publishing Company, Inc., of New York, purchased the publication, changing its name to SUCCESSFUL CONSTRUCTION METHODS in November of that year, to CONSTRUCTION METHODS in May 1927, to CONSTRUCTION METHODS AND EQUIPMENT in December 1936, and to CONSTRUCTION METHODS in October 1939. In July 1949, the name CONSTRUCTION METHODS AND EQUIPMENT was resumed.

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Robert K. Tomlin was appointed editor of CONSTRUCTION METHODS in January 1928, was succeeded by Waldo G. Bowman in January 1946, and by Harold W. Richardson in February 1949.

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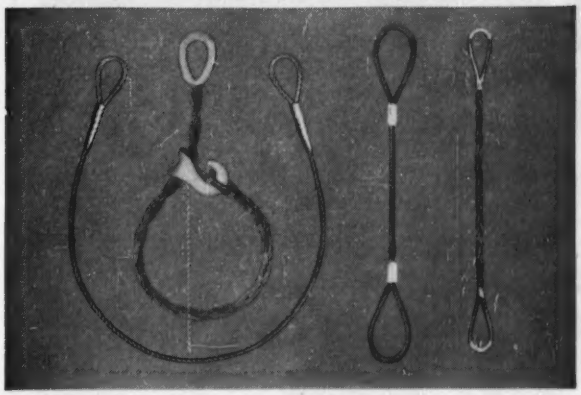

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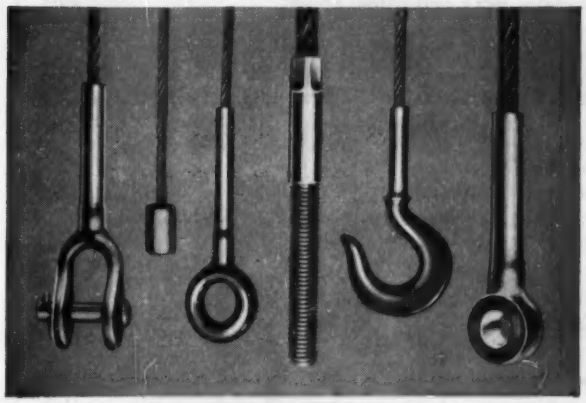

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Pay Dirt in This Issue

January, 1954

Huge Concrete Tanks Are Prestressed 50

Prestressing, vertically and horizontally, of two 125-ft dia water tanks (5,000,000 gal capacity) saves 3,000 yd of concrete and 400 tons of reinforcing steel. Interesting circular falsework supports dome and wall forms.

Rebuilt Road is High, Wide and Handsome 70

Contractor-designed plant turns out 120 tons of asphaltic concrete per hr for Pennsylvania job. Plant features hot-oil asphalt heating, compressed-air fuel atomization and one-week disassembly and re-erection.

Elevated Highway Job Bristles With Good Ideas 82

Foam-rubber strips built into bulkhead form let bars extend through edge of heavily reinforced concrete deck slabs on New York job; eliminate boring or slotting.

Wire Fabric Reinforces Asphalt on Pavements 94

Welded mesh laid on existing Washington street and between two courses on Indianapolis airport runway helps to prevent rippling of surface and formation of cracks.

Editorial—Coming Up: More and Better Roads 49

Roadbuilding is construction bright spot. Miles of local highway make bulk of market, call for better techniques.

Homemade Equipment Speeds Reservoir Paving Job 58

Bottomless spreading hopper and rollers, handled by tractors, work up and down steep 2-to-1 California slopes.

How to Lay Concrete Pressure Pipe 60

Step-by-step photos show backhoe method of installation, generally most efficient, for rig excavates and places.

Backfilling by Internal Vibration 63

Saturation-and-vibration method consolidates fill around concrete aqueduct as tractors roll along on big pipe.

Concrete Mixing and Placing 98

Scale adjustments and weighing tolerances are discussed in fourth article, along with scale maintenance tips.

Construction Equipment News 146

Three pages feature highway-type trucks and accessories —added to previews of machinery, tools and equipment.

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NEXT MONTH | Contractors widening a highway had to cut into a railroad embankment which started to move in. Bank could not be unloaded nor flattened. Read in February issue how ingenuity did the job.

6.1 MILE SHORT CUT

sets earth-moving records!

IN THE HEART OF THE GREAT SMOKIES, between Black Mountain and Old Fort, two new 22-foot pavements with 4-foot center strip and 10-foot shoulders, have at last replaced a dangerous bottleneck.

The contract called for blasting and slicing record cuts through mountaintops—and phenomenal fills—but the W. E. Graham Construction Company of Cleveland, N. C., moved 3½-million cubic yards in less than three-quarters of the time estimated!

Not bad for a job that included an 880,000 cubic-yard fill, a 440,000 cubic-yard cut, up to 350-foot differences between fill bottoms and pregraded knolls (all within 450 feet of roadway)—and a 173-foot-deep fill over a 66" x 576' culvert!

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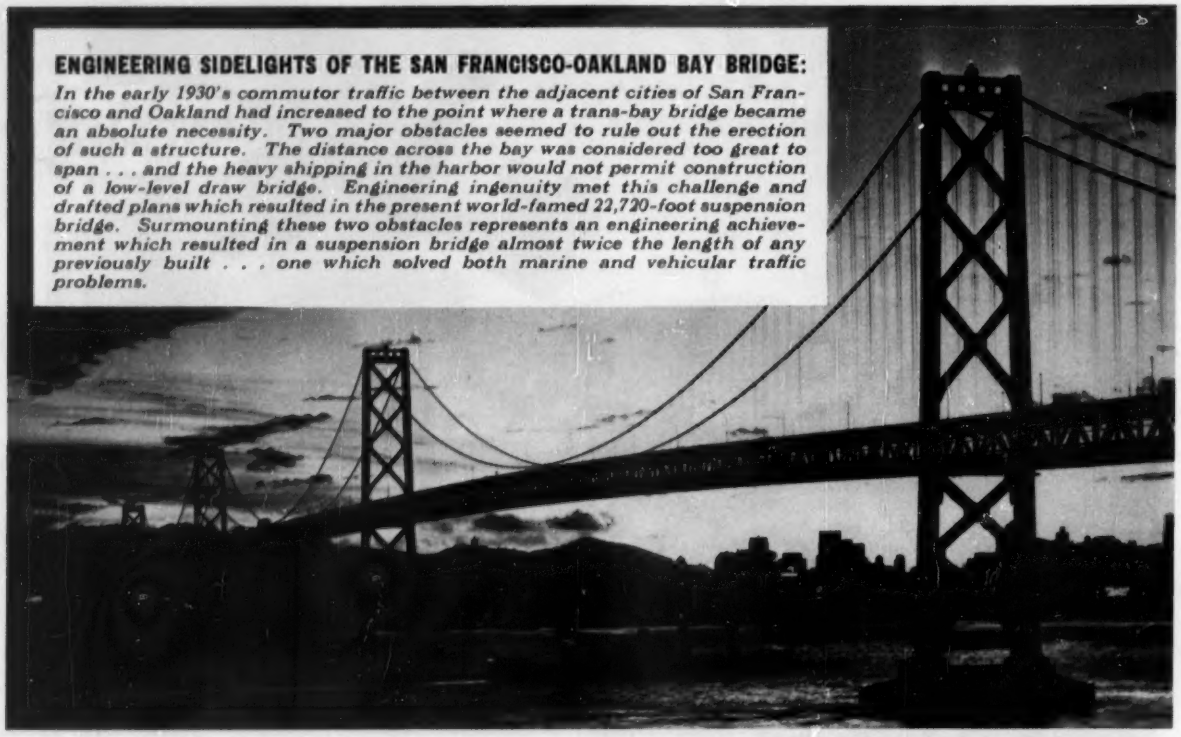
FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

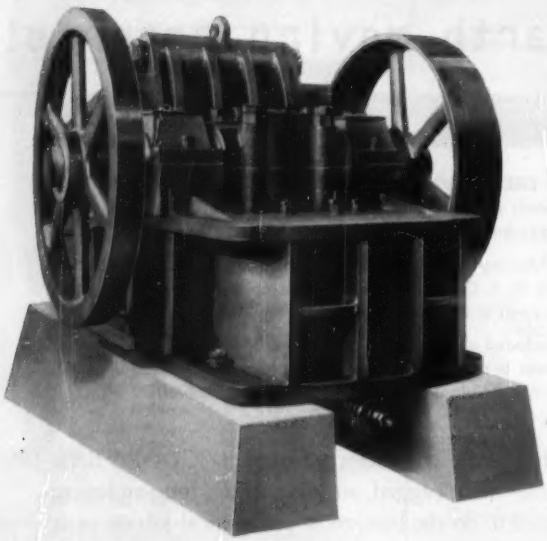
GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

ENGINEERING SIDELIGHTS OF THE SAN FRANCISCO-OAKLAND BAY BRIDGE:

In the early 1930's commutor traffic between the adjacent cities of San Francisco and Oakland had increased to the point where a trans-bay bridge became an absolute necessity. Two major obstacles seemed to rule out the erection of such a structure. The distance across the bay was considered too great to span . . . and the heavy shipping in the harbor would not permit construction of a low-level draw bridge. Engineering ingenuity met this challenge and drafted plans which resulted in the present world-famed 22,720-foot suspension bridge. Surmounting these two obstacles represents an engineering achievement which resulted in a suspension bridge almost twice the length of any previously built . . . one which solved both marine and vehicular traffic problems.





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For Complete Information on all the outstanding features of Traylor Type H and HB Jaw Crushers, send for your free copy of bulletin 4105.

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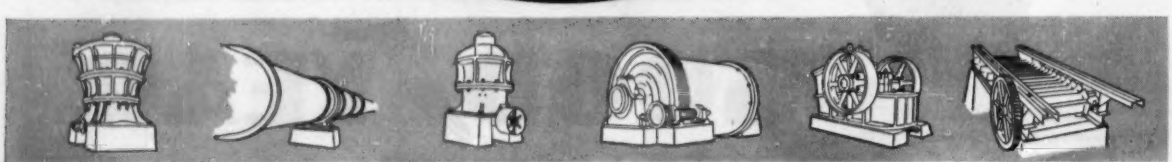

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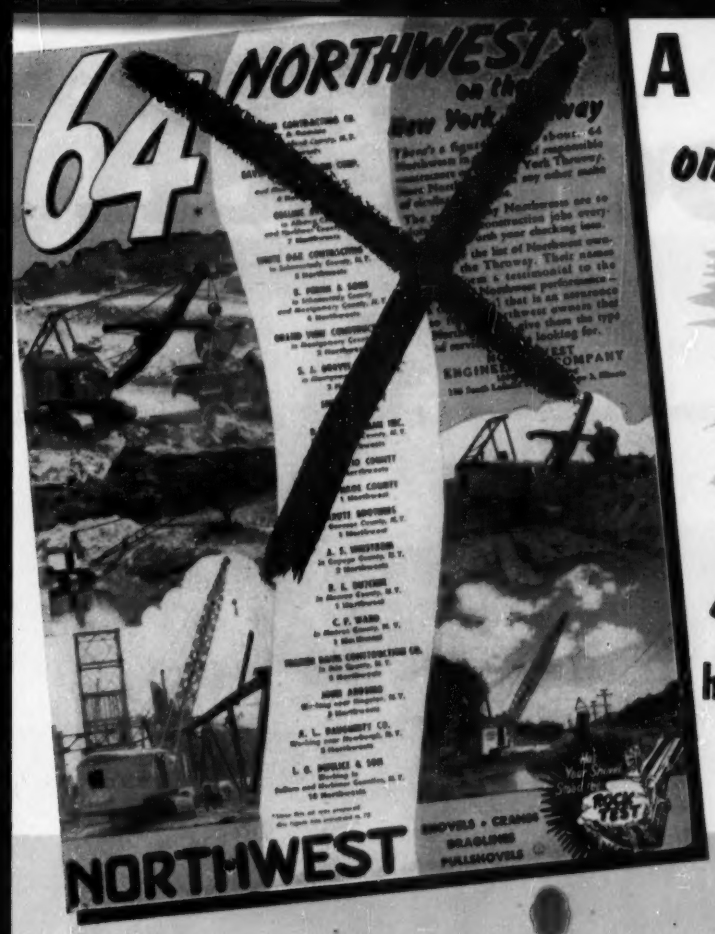

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Tires take a terrific beating. Tire costs can skyrocket. Yet Corvallis reports that even after this rugged work, its B. F. Goodrich Rock tires can be recapped two and three times!

One reason for such outstanding tire performance is the patented BFG nylon shock shield. Layers of strong, nylon cords under the tread of B. F. Goodrich off-the-road tires stretch together to protect the tire body from smashing road shocks. This nylon shock shield gives you a 4-way saving: (1) more original hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation. You pay nothing extra for this exclusive B. F. Goodrich feature.

And BFG Rock tires (above) have a specially-compounded tread that defies rock cuts and snags. The non-directional tread grips in forward or reverse, resists slippage. You lose no time rescuing bogged-down equipment.

B. F. Goodrich off-the-road tires give longer service at lower cost. See the complete line at your BFG retailer's. The address is listed under Tires in the Yellow Pages of your phone book. *The B. F. Goodrich Company, Tire and Equipment Division, Akron 18, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

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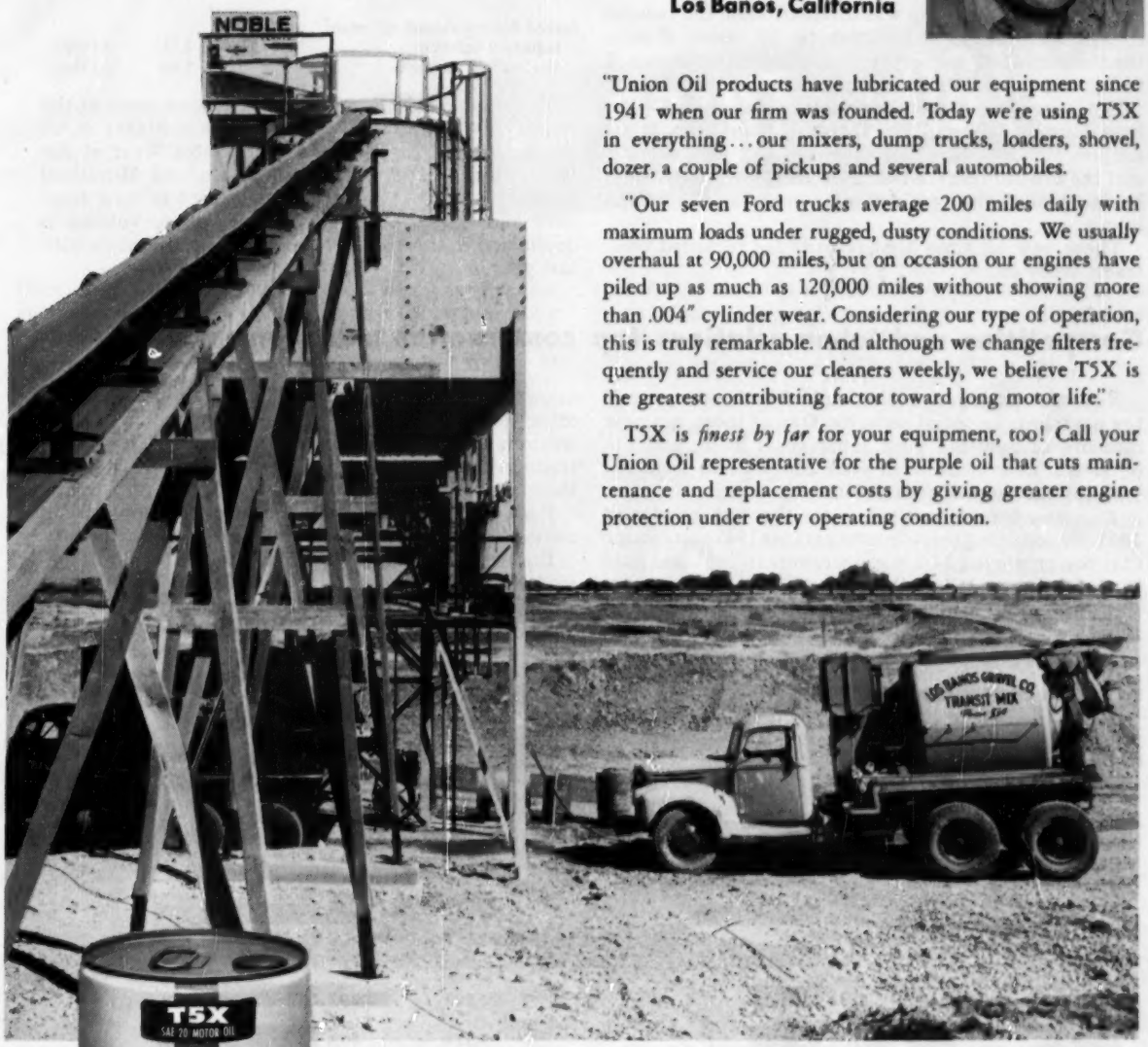
"Union Oil products have lubricated our equipment since 1941 when our firm was founded. Today we're using T5X in everything... our mixers, dump trucks, loaders, shovel, dozer, a couple of pickups and several automobiles.

"Our seven Ford trucks average 200 miles daily with maximum loads under rugged, dusty conditions. We usually overhaul at 90,000 miles, but on occasion our engines have piled up as much as 120,000 miles without showing more than .004" cylinder wear. Considering our type of operation, this is truly remarkable. And although we change filters frequently and service our cleaners weekly, we believe T5X is the greatest contributing factor toward long motor life."

T5X is *finest by far* for your equipment, too! Call your Union Oil representative for the purple oil that cuts maintenance and replacement costs by giving greater engine protection under every operating condition.



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It's Your Business . . .

Old Year Rings Up New Construction Records

HEAVY CONSTRUCTION last year turned out to be better than the forecasters could foresee. Recorded contract awards topped $15.1 billions. This is the second highest year, down only 3% from the $15.7 billion record last year.

A year ago a 4% drop was forecast. Then the federal construction cutbacks proved to be more drastic than anticipated earlier so that by September an 8 to 9% lag behind 1952 appeared to be in the cards.

But three big December awards cured that—the Erie Mining $300-million Taconite plant, the $100-million McLouth Steel slab furnace and soaking pits, and the $70-million contracts for the Mackinac Straits bridge pushed the year's volume over the $15 billion hump.

These new all time high records for recorded contracts were set:

Highest dollar volume on record for contracts awarded:	*Billions dollars*	*Change from 52*
State and Municipal public works	$8.7	+23%
Private industrial, commercial, mass housing	8.6	+21%
Waterworks	0.35	+ 5%
Sewerage	0.43	+39%
Bridges	0.75	+80%
Highways	1.77	+26%
Commercial buildings and mass housing	4.65	+20%
Second highest volume on record		
Industrial building	3.15	+16%
Unclassified contracts	1.66	+19%

This construction is more active in some areas of the country than in others. Private work is higher in all regions except the South and in states West of the Mississippi, where it is down. State and Municipal contracts are higher everywhere except in New England and West of the Mississippi, where volume is down, and in the Far West where it is about even with last year.

Competition and labor relations top construction management problems

You are getting two dividends from your payroll tax payments on social security. One of these is a new measure of how big your labor costs loom, and the other is a new measure of your competition from increasing numbers of contractors.

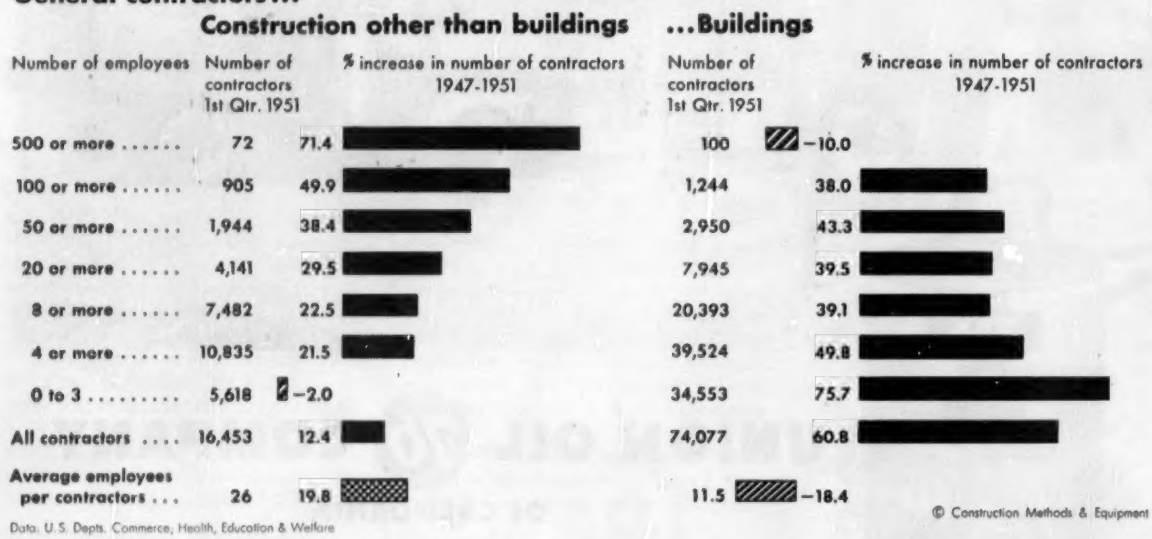
This new report, just out, is for the first quarter of 1951. By referring to its counterpart for 1947 you can see that you employed 34% more workers in 1951 and paid them 74% more dollars than you did four years before. But these ratios differ according to your type of work. Building contractors for example, employed 36% more workers and increased their payrolls 74%. But other general contractors employed only 35% more workers while upping their payrolls 81%. The special trade subcontractors increased their workers 31% and their payrolls 71%.

Part of this additional construction employment comes from the big increase in number of contractors.

Builders numbered 74,077 in the 1951 payroll period, a rise of 60.8% in four years. But the big increase, 75.7% was in those companies employing 3 or less workers. They account for 34,553 firms. The other

(Continued on page 12)

General contractors...


Construction other than buildings
...Buildings
Number of employees
Number of contractors 1st Qtr. 1951
% increase in number of contractors 1947-1951
Number of contractors 1st Qtr. 1951
% increase in number of contractors 1947-1951
500 or more 72 71.4
100 or more 905 49.9
50 or more 1,944 38.4
20 or more 4,141 29.5
8 or more 7,482 22.5
4 or more 10,835 21.5
0 to 3 ..... 5,618 −2.0
All contractors 16,453 12.4
Average employees per contractors ... 26 19.8
100 −10.0
1,244 38.0
2,950 43.3
7,945 39.5
20,393 39.1
39,524 49.8
34,553 75.7
74,077 60.8
11.5 −18.4

Data: U.S. Depts. Commerce, Health, Education & Welfare

© Construction Methods & Equipment

BUILDERS increase at the bottom, other contractors at the top.

Announcing
Major Advance in
Tractor Design!

New Caterpillar oil-type flywheel clutch

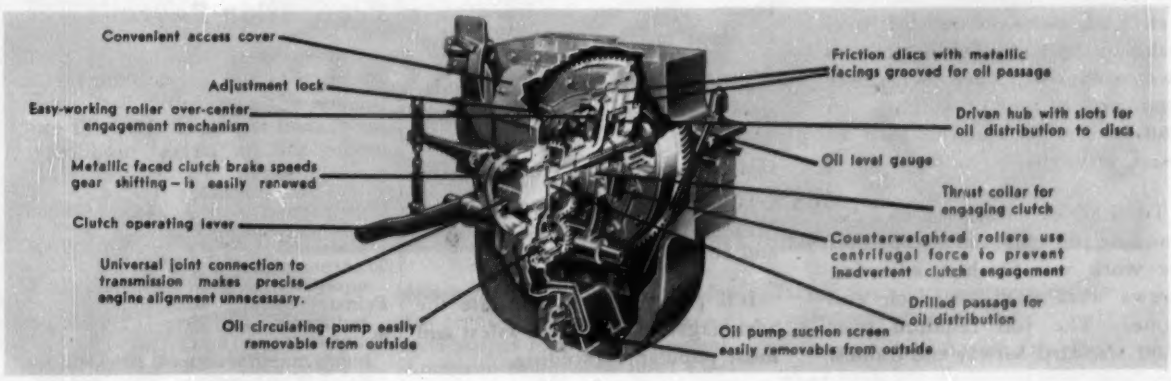
now standard in the D8, D7 and D6!

Once again Caterpillar leads the field in an advance that boosts production, cuts down time and lowers operating costs. The new oil-type flywheel clutch, now standard in the Cat* D8, D7 and D6 Tractors, means a new high in money-making performance for you from these three rugged machines. Exhaustive on-the-job tests prove that this clutch lasts many times longer than other clutches under *identical* conditions. They also prove it enables you to run these tractors two to four times longer before making clutch adjustments.

Here's how it works. The oil system is entirely separate from that of the engine. While the engine is running, the oil pressure flows to all working parts of the clutch. Oil is fed constantly through the radial and circumferential grooves in the friction discs even when the clutch is engaged, thus cooling the friction discs and pressure plates at all times. As a result, there's minimum opportunity for wear and heating to take place. That's why adjustments are very seldom needed and disc replacement normally required no more often than engine overhauls. For easy access, the clutch has a dirt-proof housing with a big opening at the top—a mechanic doesn't have to disturb engine or transmission to get at it.

Get the whole picture from your Caterpillar Dealer. Remember, he backs all sturdy yellow equipment with genuine parts service—there's never an "orphan" in the Caterpillar line. Ask him to demonstrate on the job!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.


Convenient access cover
Adjustment lock
Easy-working roller over-center engagement mechanism
Metallic faced clutch brake speeds gear shifting – is easily renewed
Clutch operating lever
Universal joint connection to transmission makes precise engine alignment unnecessary.
Oil circulating pump easily removable from outside
Friction discs with metallic facings grooved for oil passage
Driven hub with slots for oil distribution to discs
Oil level gauge
Thrust collar for engaging clutch
Counterweighted rollers use centrifugal force to prevent inadvertent clutch engagement
Drilled passage for oil distribution
Oil pump suction screen easily removable from outside

New Caterpillar oil-type flywheel clutch gives you greater dependability and lower service and maintenance costs than any other clutch under identical conditions, normal or tough.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

Serving as shoring, these 50 towers made up from standard Safway scaffolding support loads of 20 tons each.

U. S. Navy Builds a Hangar!

50 Towers of Tubular Steel Made Up from Standard Safway Scaffolding Speed Construction

On one of the world's largest scaffolding jobs — this lighter-than-air hangar for the United States Navy on the East coast—Safway all-steel scaffolding was used exclusively in speeding construction. An estimated 92 miles of tubular steel make up the 50 scaffolding towers used as shoring. Since each tower supported 20 tons of weight, each scaffold leg sustained a load of about 3000 lbs.

To allow easy lowering and dismantling of the scaffolding after the work was finished, adjusting screws were used on each end frame. The job required over 8400 standard Safway end frames.

BUILT-IN SAFETY FEATURES

Safway design gains its strength from trouble-free wing nuts that solidly hold carbon steel tubular cross braces to end frames. Cross braces pivot on hardened steel Hi-Shear rivets.

Making the most out of tubular steel is standard Safway practice. That's why you gain substantial savings in operating costs by using Safway scaffolding . . . a fact well supported by experience of builders and contractors everywhere.

It'll pay you to investigate the advantages of America's safest and most popular scaffolding.

For more facts, write for your FREE bulletin . . . . . .

SAFWAY STEEL PRODUCTS INCORPORATED 6243 West State St. MILWAUKEE 13, WIS.

Manufacturers of Tubular Steel Scaffolding and Equipment

RENTED and SOLD by distributors everywhere

IT'S YOUR BUSINESS . . .

Continued from page 10

39,524 had 4 or more workers. Of these, 7,945 contractors had 20 or more payrollees. The builders averaged 11.5 employees per company, a drop of 18.4% in the four years.

Other general contractors numbered 16,453, an increase of 12.4% in four years. But they got bigger and bigger. They averaged 26 workers per company, an increase of 19.8% in the four years. Companies employing 3 or less workers actually decreased 2% to 5,618. The other 10,835 firms who employed 4 or more workers increased 21.5% in numbers. Of these, 4,141 had 20 or more workers, an increase of 29.5%. And the rate of rise in numbers of contractors goes up with size, with 50 or more workers, 38.4% more contractors; with 100 or more workers, 49.9% more contractors; with 500 or more workers, 71.4% more contractors.

This evidence of the increase in the number and size of the competition on heavy construction is another view of the same situation reported on this page in September. Then a special CME field survey found that among the larger contractors their numbers increased 39% from 1949 to 1953 and their capacity to handle construction increased 50%.

Contract Construction Has Largest Production Payrolls

One measure that classes construction as our largest industry is the size of its payroll, a first quarter payroll at that. In 1951 for example, the six largest production payrolls were:

Construction	$1,923,671,000
Machinery, except electrical	1,560,097,000
Transportation equipment	1,400,339,000
Primary metal industries	1,222,244,000
Transportation equipment, manufacturing	1,159,605,000
Food and kindred products	1,100,705,000

In addition, construction supports in major part, almost 16%, of retail trade payrolls: $660 million from building material, lumber and hardware dealers.

All the services—barbers and beauty shops, laundries and cleaners, hotels and movies, shoe,

(Continued on page 16)

AMSCO MANGANESE STEEL WELDMENTS
ADD NEW LIFE TO WORN EQUIPMENT

Amsco Welding Rods and Electrodes For repair welding of manganese steel shapes to worn equipment, American Manganese Steel Electrodes retain their toughness and give real operating savings.

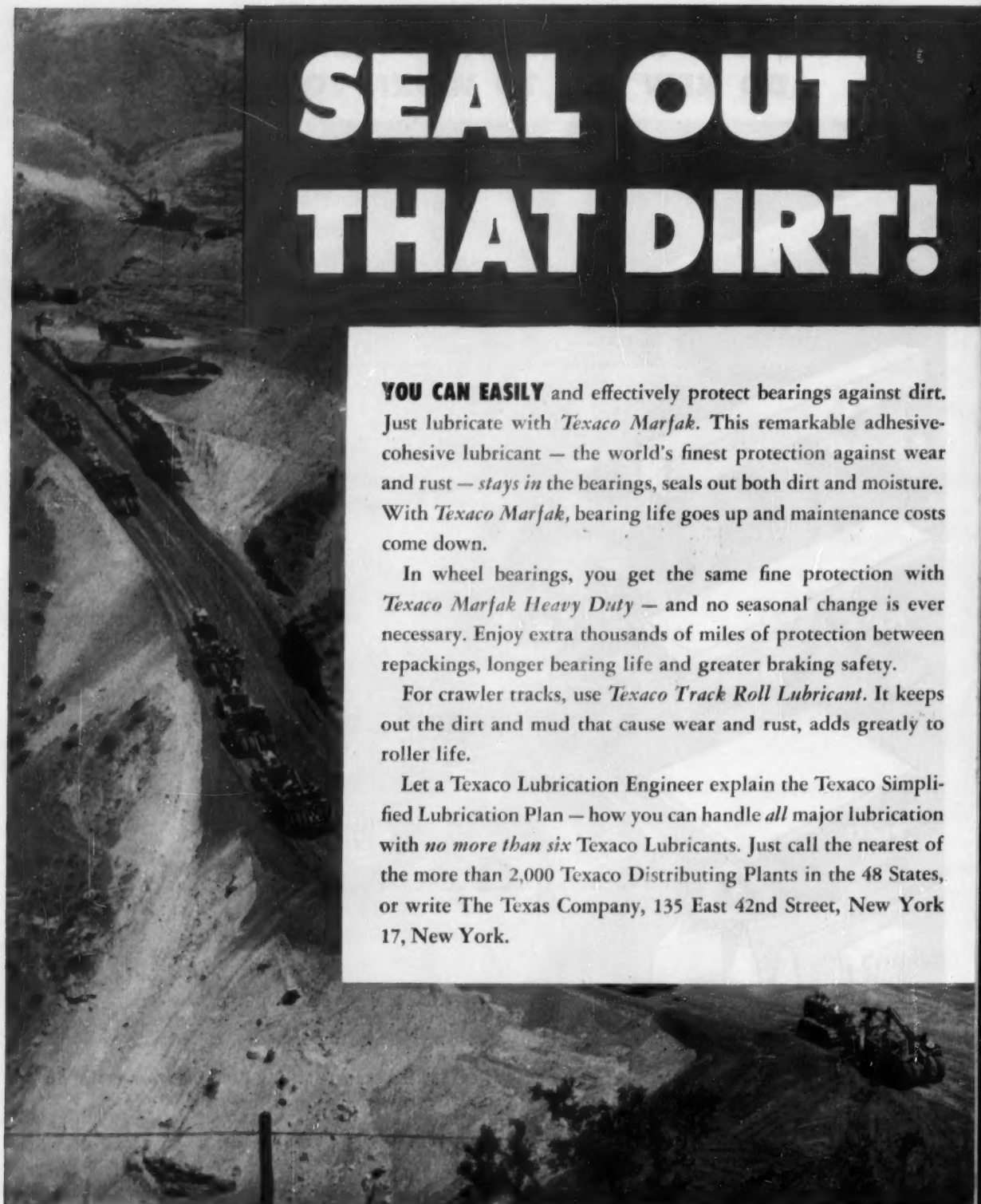
Amscoating with Amsco Hardfacing Rods increases service life . . . reduces shutdowns.

Contact your Amsco Distributor or write for illustrated catalog WA-77 on Amsco Manganese Steel Weldments and Hardfacing Selector Guide.

Brake Shoe

AMERICAN MANGANESE STEEL DIVISION
385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



SEAL OUT THAT DIRT!

YOU CAN EASILY and effectively protect bearings against dirt. Just lubricate with *Texaco Marfak.* This remarkable adhesive-cohesive lubricant — the world's finest protection against wear and rust — *stays in* the bearings, seals out both dirt and moisture. With *Texaco Marfak,* bearing life goes up and maintenance costs come down.

In wheel bearings, you get the same fine protection with *Texaco Marfak Heavy Duty* — and no seasonal change is ever necessary. Enjoy extra thousands of miles of protection between repackings, longer bearing life and greater braking safety.

For crawler tracks, use *Texaco Track Roll Lubricant.* It keeps out the dirt and mud that cause wear and rust, adds greatly to roller life.

Let a Texaco Lubrication Engineer explain the Texaco Simplified Lubrication Plan — how you can handle *all* major lubrication with *no more than six* Texaco Lubricants. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

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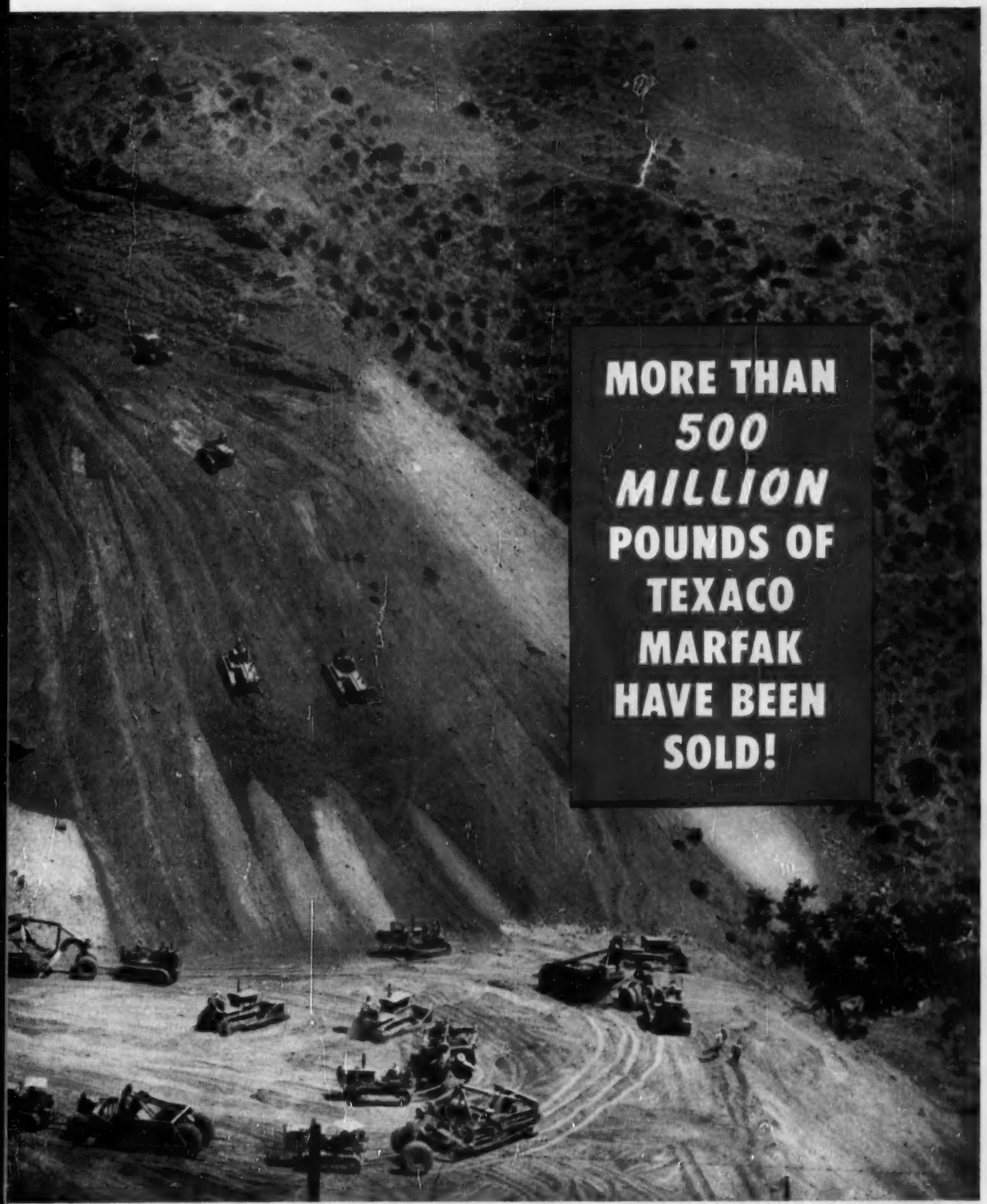
METROPOLITAN OPERA
radio broadcasts
every Saturday afternoon.
See newspaper for
time and station.

TEXACO

TEXACO



Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

tv, radio, auto and other repair shops—top construction payrolls by only $92 million.

Construction is big business in the USA. And it packs a big wallop in keeping other businesses big.

Some Big Jobs of the Month

Napp-Greco Co., 1900 McCarter Highway, Newark, N. J. Sewage disposal plant and sewer trunk line system with 4,000,000 gal. daily capacity, Kearny, N. J. for Town Council, Town Hall, Kearny, $2,381,931.

Central Pennsylvania Quarry, Stripping & Construction Co., P.O. Box 378, Hazleton, Pa. Construction of 19,414 ft. of divided road with crushed aggregate base and bituminous surface variable in width, three deck girder bridges and an I-beam bridge for the Pennsylvania State Highway Dept., 506 North Office Bldg., Harrisburg, Pa., $3,581,477.

Erie Mining Co. (Bethlehem Steel Corp., Youngstown Sheet & Tube Co., Interlake Iron Corp., The Steel Co. of Canada) c/o Pickands, Mather & Co., Union Commercial Bldg., Cleveland, Ohio. Design and construct taconite development, Aurora, Minn. Project includes ore processing plant, housing for workers, 73-mi railroad, complete harbor at Two Islands on Lake Superior with docks and generating plant, for Anaconda Copper Mining Co., Engineering Div., 25 Broadway, New York, N. Y. Estimated cost $300,000,000.

Rust Furnace Co., 575 Sixth Ave., Pittsburgh, Pa., design and construct slab heating furnace and 5 batteries of soaking pits for hot strip mill at Trenton, Mich., for McLouth Steel Corp., 300 S. Livernois St., Detroit, Mich. $100,000,000.

S. J. Groves & Sons Co., P.O. Box 185 Woodbridge, N. J. Grading, drainage, structures and paving 11.2 mi Garden State Parkway from White Horse Pike to Beesley's Point Bridge, Egg Harbor and Galloway Townships, Atlantic Co. for New Jersey Highway Authority, State Highway Office Bldg., 1035 Parkway Ave., Trenton, N. J. $7,777,777.

Walter Kidde Constructors, Inc., 140 Cedar St., New York, N. Y. 17-story hospital at Newark, N. J., for the Dept of Public Affairs, City Hall, Newark, N. J., general contract, $4,104,000.

Bero Engineering & Construction Corp., McKinley Building, Buffalo, N. Y., grading, drainage structures and paving approximately 9 mi of highway, building 14 bridges 13 culverts and 1 retaining wall in Mahoning County for the Ohio Turnpike Comm., 139 E Gay St., Columbus, Ohio, $9,388,659.

Bryant & Detwiler Co., 2304 Penobscot Bldg., Detroit, Mich. 12-story brick, steel and concrete administration building at Dearborn, Mich., for the Ford Motor Co., 3000 Schaefer St., Dearborn, $14,000,000.

Ferber Co., Ackerman Ave. and Belair Road, Hackensack, N. J., liquid fuel rocket engine plant for Navy Dept., Rockaway, N. J., for Reaction Motors, Inc., Elm St. and Stickel Ave., Rockaway, N. J., $3,500,000.

Haas & Haynie, 275 Pine St., San Francisco, Calif., shopping center, Macy's Department Store in Hillsdale development, San Mateo, Calif., $6,318,000.

THE NEW M·S·A FIRST AID KIT IS DIFFERENT . . . BECAUSE OF IMPORTANT LITTLE THINGS LIKE THIS

Open lid serves as shelf when kit is mounted on wall or vehicle
Clear, concise, first aid instructions
Easy-to-keep-clean case
Wall mounting brackets
Dust and moisture proof rubber gasket
Packages extend above case for easy removal
Easy-to-read identifications

Here's a First Aid Kit that gives you the important *extras* in quality and performance. A few of the important case design and construction features which serve your needs better are illustrated above. And that's only part of the New M.S.A. First Aid Kit story. Quality control, and improved first aid materials are other important improvements that add up to the big difference!

So you can be sure of freshness, purity and sterility, every Unit "D" package is stamped with a Quality Control number. This number identifies the "pedigree" clear back through our every operation.

Our modernization program extends to first aid materials. Color keying of labels for antiseptics, burn treatments, and others assure quick identification. Swabs have gauze tips which are less absorbent, assure maximum utilization of antiseptic.

And there's more, lots more. Get the facts today. Write for our bulletin.

MSA SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 82 Branch Offices in the United States and Canada

TERRIFIC

BREAK-OUT POWER

The versatile Drott Skid-Shovel easily out-performs any comparable equipment. Its exclusive *pry-over-shoe* power provides amazing break-out action — a digging force greater than the weight of the tractor — big loads every time. It *lifts higher* and *reaches farther* providing greater range for more effective loading, back-filling, and piling. *Exclusive Hydro-Spring* is a super shock-absorbing system that eliminates two-thirds of normal strain on tractor, loader, and operator. Get complete details. Write for Catalog 108

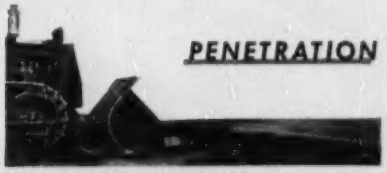
Designed for International TD-6, TD-9, TD-14A, TD-18A Crawler Tractors.

LEVEL LIFT

5. Exclusive parallelogram arrangement maintains absolute level bucket throughout the raise to a loading height of 10'8".

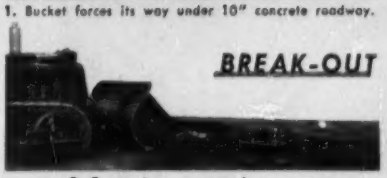
Exclusive "PRY-OVER-SHOE" Action

PENETRATION



1. Bucket forces its way under 10" concrete roadway.

BREAK-OUT



2. Tremendous pry-over-shoe power snaps off 4500 lb. chunk.

ROLL-BACK

3. The powerful TD-9 Int. tractor continues to move forward, forcing the big slab well up as the bucket begins its rollback to retain and balance the load.

SKID MOVE

4. Bucket rolled back 42°, holds slab in close, transports on skid shoes.

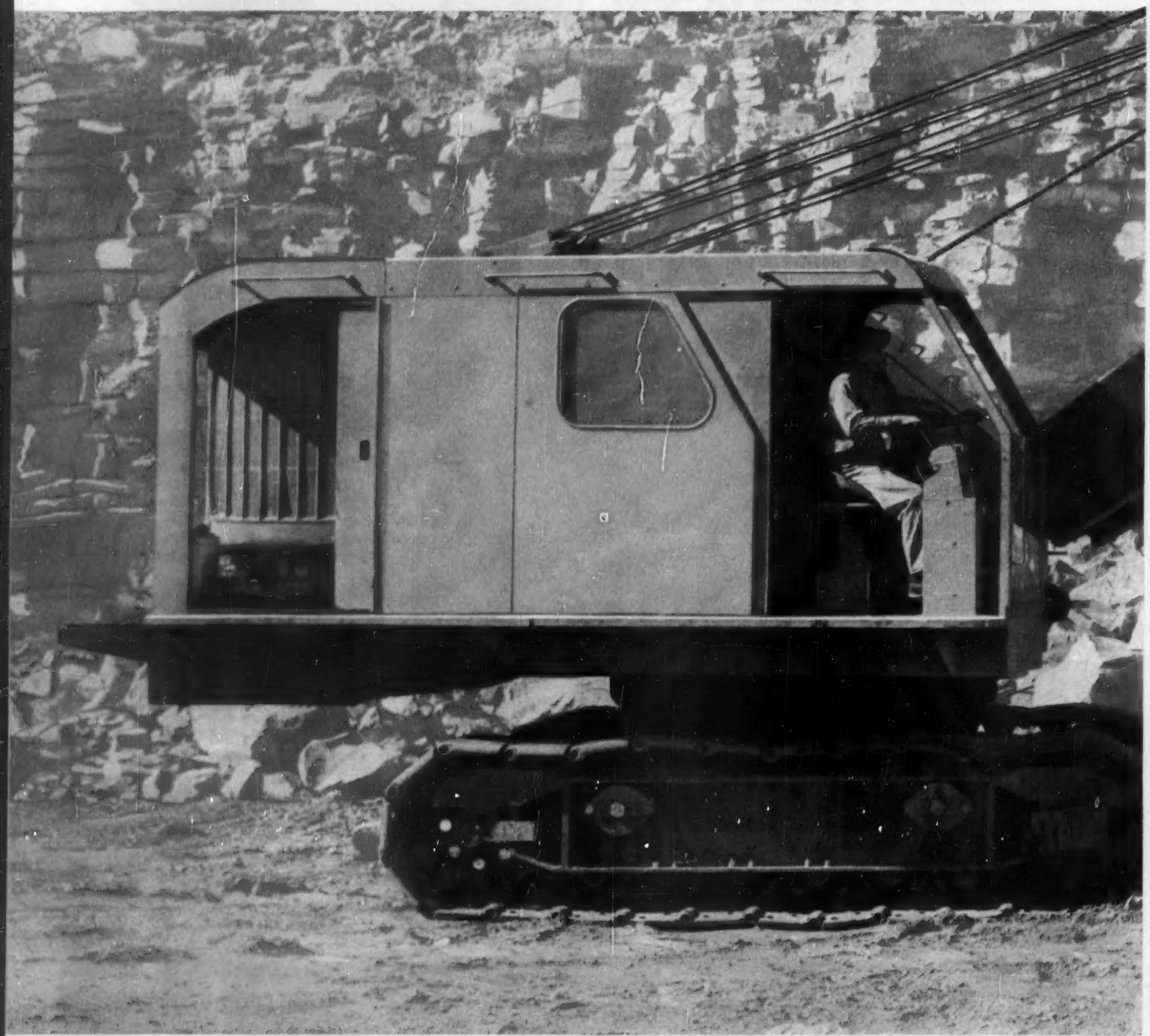
DROTT

DROTT SALES INCREASED 45% IN '53

MANUFACTURING CORP.
MILWAUKEE 8, WIS.

CONTACT YOUR DROTT INTERNATIONAL DISTRIBUTOR TODAY

Here's the American



NEW 750

It's BIG NEWS . . . the NEW American 750 . . . 35 ton capacity crane . . . 1½ yard rock shovel and backhoe . . . 2 yards as a clamshell or dragline. *It's the machine you helped build by telling us exactly what you wanted!* Ask your distributor or write direct for complete details on the great new American 750.

American Hoist
American Hoist & Derrick Co.
St. Paul 1, Minn.

MAIL THIS COUPON TODAY

AMERICAN HOIST & DERRICK CO.
St. Paul 1, Minnesota

● Please send more information on the new AMERICAN 750
☐ CRANE ☐ SHOVEL ☐ DRAGLINE ☐ BACKHOE

Name.....
Company.....
Address.....
City.....Zone....State.....
CM-1-53

MAKE IT BUDGE

WITH A MAN-SIZED *Nudge*

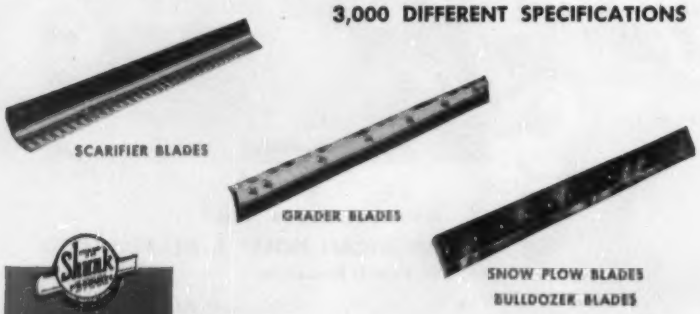
Whether you're trying to budge heavy dirt in Illinois, snow in New England or shale in the Carolinas, you can depend on SHUNK blades.

They're rolled from top-quality steel to our own specifications; economical; designed to take heavy punishment.

For almost a century the name SHUNK has been a byword in all parts of the world to everyone concerned with maintenance and construction blades . . . original equipment manufacturers, contractors, distributors. Let us show you why . . . specify a SHUNK blade for *your* job.

Literature on request.

3,000 DIFFERENT SPECIFICATIONS



Shunk MANUFACTURING COMPANY

In Our 99th Year

BEST BLADES MADE

BUCYRUS, OHIO

★ JOB TALK ★

...About Methods

How to Get a Tournarocker Out of a Hole

IT HAPPENS to every truck operator: Backing up to a dump, he sometimes mistakes soft ground for solid footing and finds the ground giving way and dropping the rear wheels into a hole. In many cases rear-drive vehicles require assistance to get out again.

The latest issue of "The Earthmover," an interesting house magazine published by the Australian subsidiary of LeTourneau-Westinghouse, contains an interesting operating tip. The Earthmover points out that the back wheels of the rear-dumping Tournarocker also may drop deep into soft ground at the fill, but that the haul unit usually can get out under its own power if the operator knows what to do.

Soft fill gives way while dumping, dropping rig's braked rear wheels into hole. Note shortened wheelbase.

Operator lengthens wheelbase by returning bowl to haul position. This pushes free-wheeling front end forward.

When the rear wheels of a Tournarocker are bogged at the fill, the driver can continue to dump his load with rear wheels locked, the wheelbase shortening as he dumps. When the empty body is returned to haul position, the lowering action will push the unbraked front wheels forward, lengthening the wheelbase.

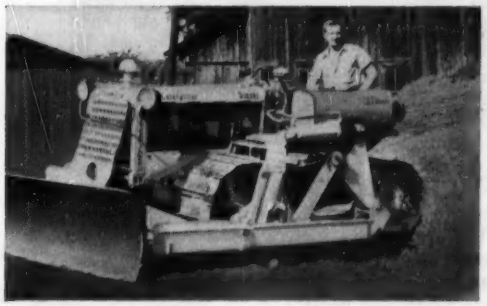
Next, the operator turns the two-wheel prime mover 90 deg, locks the front brakes in this anchor position and releases the brakes on the rear wheels. Then he operates the dump motor which hoists the empty body into dumping position. As the body raises, it again shortens the wheelbase of

(Continued on page 32)

A STORY FOR EVERY MAN WITH ROLLING STOCK

Some of the power equipment of REDICK & SONS, WOOSTER, OHIO.

SIX TROUBLE-FREE YEARS WITH CITIES SERVICE C-300 OIL!



FOR THE MAN WHO GROWS FOOD. For their trucks, cars, tractors and other power equipment, including diesel above, the Redicks use only Cities Service C-300 Motor Oil.

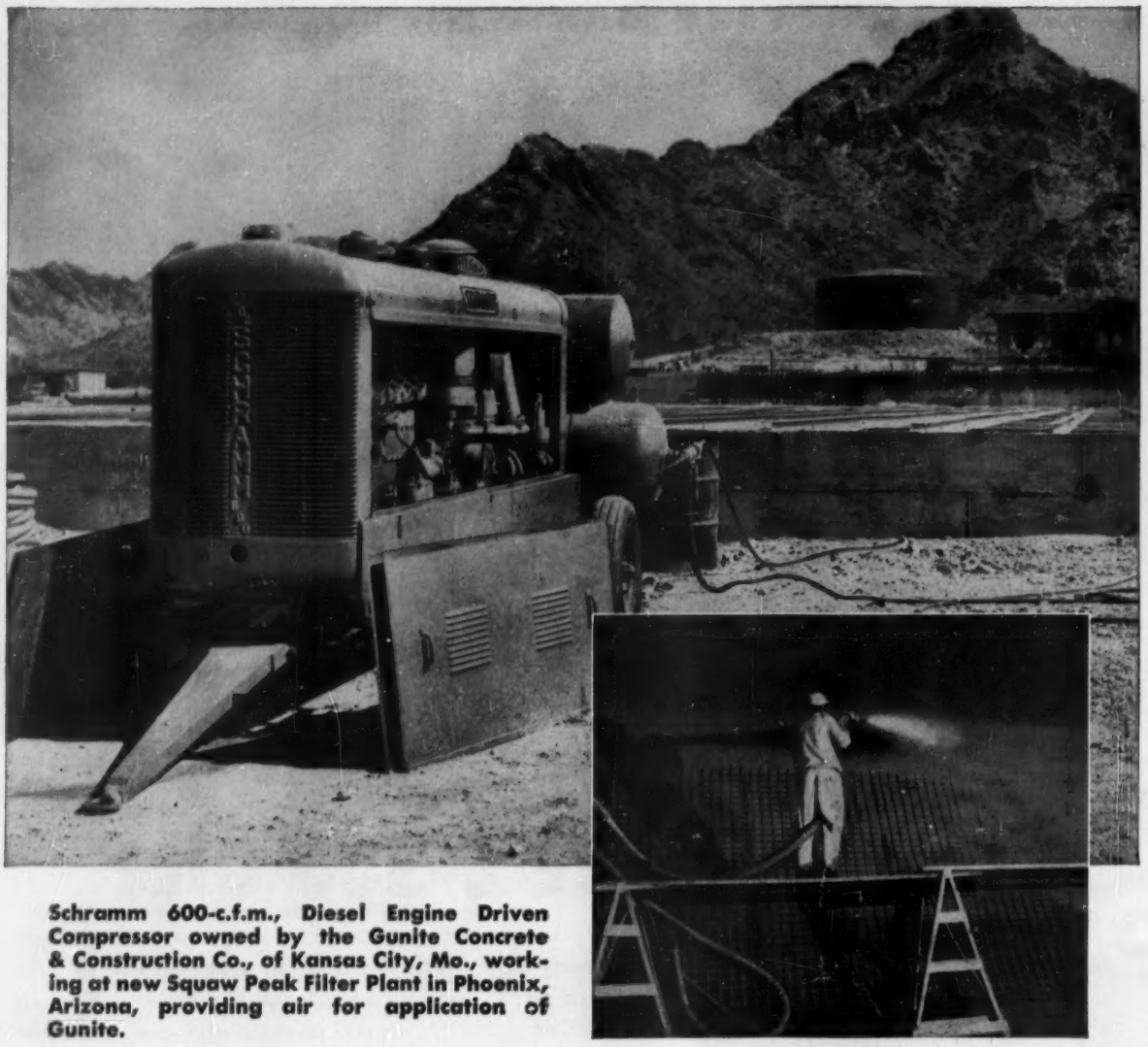
FOR THE MAN WHO TRANSPORTS FOOD. Albert Herda, trucker extraordinary, uses Cities Service C-300 Motor Oil in year 'round operation between Minnesota and Alaska!

You may say, "What's a farm story doing in this magazine?"... and it's a good question Mr. Fleet Owner, or Mr. Contractor . . . a good question until you remember that much of the equipment the Redicks will use to farm 1000 acres is the same kind of equipment you use. Diesels, gasolene engines, separate power units, all with a thousand finely machined, intricate pieces of mechanism that demand the finest lubrication in the world. THAT'S WHAT THE REDICKS GET and that's what you can get in all your equipment with Cities Service Heavy Duty C-300 Motor Oil.

This great Cities Service Motor Oil serves bus fleets, truckers, farmers and construction crews throughout most of the country. Try C-300 in your operation and check mileage, wear and performance. Call the Cities Service Office nearest you or write to Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



Schramm 600-c.f.m., Diesel Engine Driven Compressor owned by the Gunite Concrete & Construction Co., of Kansas City, Mo., working at new Squaw Peak Filter Plant in Phoenix, Arizona, providing air for application of Gunite.

Here's why you should use the *SCHRAMM MODEL 600*

FUEL SAVINGS UP TO 50% . . . Pneumastat control . . . Modern engine design . . . Proper operating speeds . . . Less horse power required by compressor . . . Super-efficiency compressor design.

SIMPLIFIED DESIGN . . . Fewer parts . . . Engine parts are interchangeable with compressor parts for lower maintenance . . . Cam operated mechanical intake valves provide greater efficiency.

SAFETY FEATURES . . . Electric push-button starter . . . Stronger, 400# test air receiver . . . Heavy grill for radiator protection . . . Easy accessibility to operating parts . . . No protruding parts.

MORE PLUS FEATURES . . . Tool boxes large enough to carry complete assortment of tools . . . Engine and Compressor cooled by water and unit can be operated with doors in place . . . Dual fan belts.

SCHRAMM, INC. • *The Compressor People* • **WEST CHESTER, PENNSYLVANIA**

SCHRAMM AIR COMPRESSORS

A SIZE AND MODEL FOR EVERY AIR NEED

20-35 60 105 210 315 600

(Advertisement)

Effect of Proper Distribution of Mass in Shovel-Crane Performance

by O. VON MEHREN*

The operation of a power crane or shovel is essentially cyclical. It involves repeated accelerations and decelerations of parts or of the whole assembly. Therefore, the time interval of the operating cycle or the "speed" of the excavator is not dependent upon the acceleration or speed of any one function alone, but upon the interrelation of all functions and the proper proportioning and balancing of power and speed between them.

It is for this reason that the printed specifications of an excavator seldom are an indication of its "speed". It serves no purpose to have a very high hoisting speed, if the swing is so sluggish that the dipper is raised to dumping height long before the machine can be rotated to dumping position. Neither does it aid "speed" to have a high swing speed if the swing acceleration is such that the full swing speed cannot be realized on the partial and short swings that occur in actual operation.

One of the most important factors in the operation and "speed" of an excavator is the distribution of the mass of the machine because of its dual effect on (1) the forward external moments to which the machine is subjected and (2) its effect on the swing acceleration and speed.

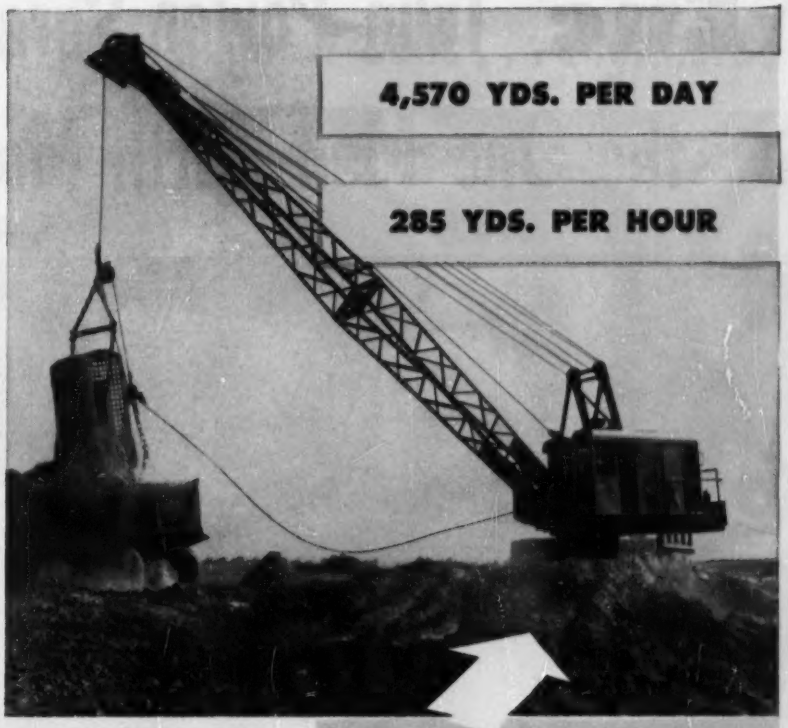
To offset the forward or "tipping" moment of the machine, a balancing or rear moment is developed by the distribution of masses in the rear which involve primarily the location of machinery and counterweight.

In order to balance the forward moment, the rear mass (M) and its radius (R) may be varied in direct proportion to each other, i.e., a back moment (MR) can be obtained by any combination of M and R that give the same product.

When the swing operation comes into play, however, the swing time cycle, in its accelerating and decelerating phases, depends on the moment of inertia of the whole turntable, which is expressed as MR^2; i.e., the accelerating and decelerating phases of a swing cycle vary in proportion to the square of the radius-R.

The proper balance between these two terms, MR and MR^2, is what determines in the last analysis a satisfactory or unsatisfactory design. All other factors being equal, machines with light masses at large radii may be relatively light-weight machines but slow in swing cycle, unless unduly large accelerating swing torques are supplied. Conversely, a machine with heavy masses at short radii may adversely affect other functions even if it proves to have a faster swing cycle.

*Chief Design Engineer, The Thew Shovel Co.



CHECK YOUR DRAGLINE PRODUCTION WITH THIS...

LORAIN 820

When J. H. and N. M. Monaghan of Derby, Colorado, bid this 172,000 yd. borrow pit excavation, they knew it would take a high-speed dragline to make money for them. A long-crawler, Lorain-820K, with a 3-yd. bucket was their choice. Working two shifts, this one Lorain keeps six 10-yd. dump trucks busy handling a daily average of 4,570 yards of highway fill. Daily production has reached a high of 4,700 yards. That's big dragline production . . . and there are important reasons why this Lorain is a fast, maneuverable, low-cost performer.

Engine "hang-on" and "no-stall" performance are the result of Hydraulic Coupling Power Take-Off. The 90° swing cycle used on this job is fast. Two travel speeds in both directions. Crawler steering and tread lock are air controlled. There is less down-time, less drag cable replacement because the "Cable Miser" fairlead feeds cable to the bucket through geared sheaves that turn the same direction and speed as cable travel. A 34" hoist sheave adds to hoist cable life. For facts about a real dirt-moving, profit-making Dragline, get the complete story from your Thew-Lorain Distributor.

Ask Your THEW-LORAIN Distributor to help you . . .

1. Get full data on Lorains — from ⅜-yd. to 2-yd. shovel classes, cranes up to 45-ton capacity, crawler or rubber-tire mountings, 5 interchangeable front ends. Ask your Thew-Lorain Distributor for recommendations, prices and delivery data.

2. See a Lorain in action! Ask your Distributor to show a Lorain nearby — at work on an actual job. Let your Thew-Lorain Distributor show you his special shop facilities and parts-in-stock.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN® 820 FOR BIG JOB PROFITS

"Euc" Twin-Power Scraper . . . the One-Man Earth Moving Spread!

High production with one man and one machine

- Total of 380 or 400 h.p.
- 18 cu. yds. struck
- Two Torque Converters
- Two Torqmatic Transmissions
- 4-section reversible and interchangeable cutting blades
- Hydraulically actuated bowl, apron & ejector—only 13 ft. of cable

Five years of field experience have proved the versatility of the Twin-Power Scraper for contractors, large and small . . . it's a self-loading scraper in practically any material.

It's paying off for . . .

LARGE CONTRACTORS . . . as an independent production unit or self-contained utility scraper for all loading, hauling and grade conditions.

MEDIUM SIZE CONTRACTORS . . . requiring maximum production with minimum capital investment . . . and scrapers that can work when adverse weather and job conditions stop other equipment.

SMALLER CONTRACTORS . . . who can bid on subcontracts with limited equipment and personnel . . . its versatility has helped to make these users successful bidders on big jobs, too.

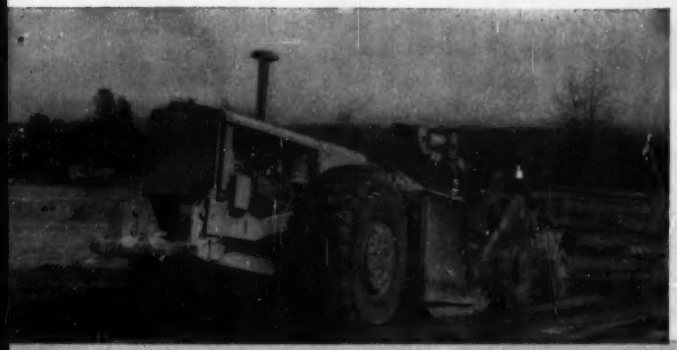
But seeing is believing, so ask your distributor where the nearest "Twins" are working or see the new Euclid color film featuring the Twin-Power Scraper at work on a wide range of jobs. A new folder, Form T551, is available for the asking.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Top Performance on the Toughest Jobs . . . *anywhere!*

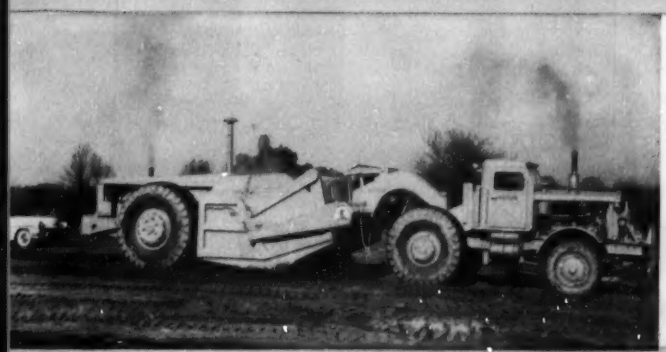


At Folsom Dam in California, Savin Construction Co. used 4 Twin-Power Scrapers as part of their large Euclid fleet. This well known contractor has purchased seven "Twins", having added additional units as a result of outstanding performance of his original machines on the New Jersey Turnpike. On big jobs like these, the flexibility of this scraper really pays off in high production and low cost per yard.

"Twins" have proved to be an ace in the hole for J. C. Critcher Inc. of North Carolina in getting larger, more profitable contracts. On this mountain highway job the "Euc" gave such a good performance that a second machine was purchased before completion of the contract. With two 190 h.p. engines and torque converters, the "Twin" easily climbed grades where crawlers and pans had to have pusher assistance.

Working in sandy clay on this Alabama road job, the Twin-Power Scraper proved a versatile, high production machine for L. J. Cousins Construction Co. Ability to self load and carry heaped loads up to 24 cu. yds. at speeds five or six times as fast as crawler drawn scrapers makes this "Euc" a top performer on small jobs as well as the big ones.

Tough loading conditions on the New York Thruway are taken in stride by the five Twin-Power Scrapers used by John Arborio on a 2½ million yard contract. Because of their tremendous power and traction the "Eucs" were able to work in the sticky, wet clay that stymied other equipment on this section of the big job.



Working on the Ohio Turnpike for Western Contracting Corp., this Euclid Twin-Power Scraper has top extensions that increase the struck capacity to 21 cu. yds. On one section of the job, the scraper picked up loads averaging 23 cu. yds. in 1.1 minute and made a complete 4700′ cycle—load, haul, spread and return—in 5.3 minutes.

Stripping blue clay at an open pit gypsum quarry in Iowa, this Euclid has plenty of power and traction to self load and haul to the waste dump at high speed. Daily production records on this job show that a Euclid Twin-Power Scraper can move as much yardage as four crawler tractors and pans of comparable size on an 800′ haul.

WRITE TODAY for performance data and a new catalog on Euclid Twin-Power Scrapers

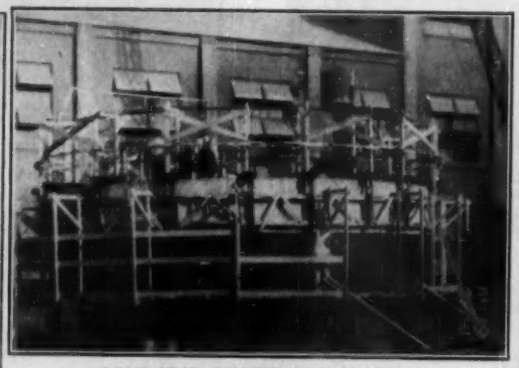
EUCLID DIVISION GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

MOVE MORE LOADS PER HOUR AT MORE PROFIT PER LOAD WITH TWIN-POWER SCRAPERS

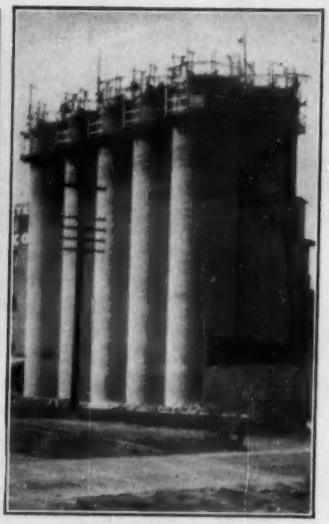
(Advertisement)

SLIPFORMS RAISED HYDRAULICALLY with "CONCRETOR" HYDRAULIC JACKS

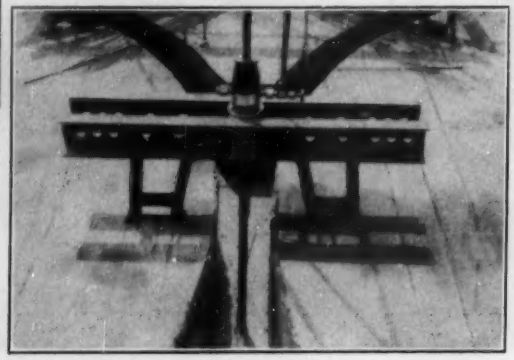
LOCKE, INC. (GENERAL ELECTRIC SUBSIDIARY), BALTIMORE, MD.



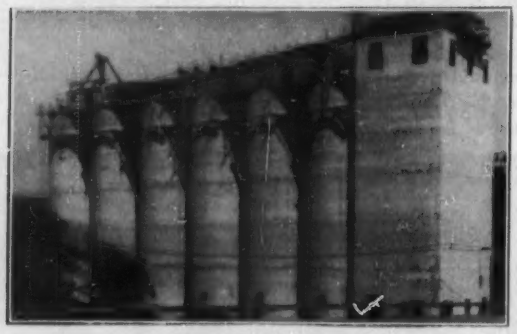
LONE STAR CEMENT CORPORATION, NORFOLK, VA.



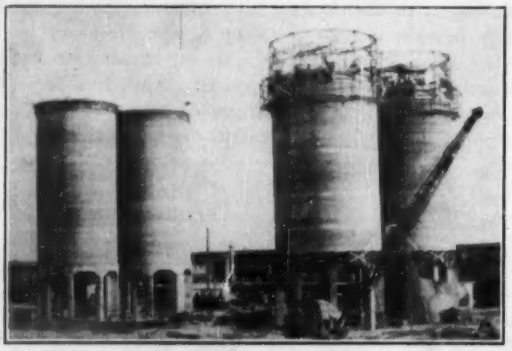
INTERSTATE MILLING CO., CHARLOTTE, N. C.



Below—WILKENS-ROGERS MILLING CO., WASHINGTON, D. C.



Above—COMPLETE CONCRETOR UNIT



Below—ALLIED CHEMICAL & DYE CORP. PLANT, E. ST. LOUIS, ILL.

SYNCHRONIZED JACKING

CONTROLLED CENTRALLY OR INDIVIDUALLY

Write our Engineering Department for full particulars on the Concretor system and rental plan available.

B. M. HEEDE, INC.

80 BROAD STREET • NEW YORK 4, N. Y.

CONCRETOR SILOS

Trade Mark

U. S. AND FOREIGN PATENTS

Caterpillar No. 6 Shovel gets the call on Chicago's biggest excavating job

Excavation for the huge 2350-car, multi-level, underground Grant Park Garage, on Chicago's lake front, involves moving more than 500,000 cubic yards of earth. It's the biggest job of its kind ever undertaken in the city.

When the digging started last spring, several competing types of tractor-shovels were tried out by Speedway Wrecking Company, excavating contractors. It was the Cat* No. 6 Shovel that won hands down.

The big bucket of this No. 6 handles 2-yard loads with ease. Loading into trucks, Speedway reports average production of 140 cubic yards per hour. And the machine turns in this kind of performance day after day without a hitch.

Excellent visibility, easy control, fast lift and turn action are added reasons why operators and owners both like this big, tough digging and loading tool.

All you need is a demonstration on your own job to be convinced. Your Caterpillar Dealer will arrange to demonstrate whenever you give the word. And he'll back the machine with top-notch service and genuine parts.

Remember—Caterpillar equipment not only *earns* more profit on the job—it's *worth* more when you want to sell. Look at your last cost first!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

THE NEW BARBER-GREENE *Mixall* MEETS THE NEED FOR ALL MAINTENANCE AND SMALL PAVING JOBS

The quotation at the top of this page is typical of impartial observers who have seen the new Barber-Greene MIXALL perform. There is widespread agreement among editors, road builders and government officials that the need for a machine capable of on-the-spot production of even the highest type hot mixes has been answered by the development of the MIXALL.

Primarily designed for "stitch in time" maintenance to prevent major break-ups of much needed roads, the MIXALL also opens the market for surfacing of sidewalks, driveways, parking lots, service stations, playgrounds and countless others.

Once you see the MIXALL perform, you'll quickly recognize the business-building possibilities it holds for you. See your Barber-Greene Distributor for the full story—or write for information.

Barber-Greene BG

Aurora, Illinois, U. S. A.

One lever controls

8 FORWARD SPEEDS

TWO REVERSE SPEEDS

NO GEAR-SPLITTING!

New MODEL R-45 ROADRANGER®

Now 125-160 hp rigs can have the advantages of the new R-45 ROADRANGER Transmission

The famous one-stick Fuller ROADRANGER is now available for rigs powered by engines delivering up to 385 pounds-feet of torque.

With the new R-45, gear-splitting is entirely *eliminated.* Shifts are simple, short, and fast, with only one power shift in the whole series. Yet you have 8 forward speeds—available in *equal,* progressive, selective steps, none exceeding 38%—to keep your engine *always* turning in its most efficient range.

With this transmission, there's no more engine lugging, no more low rpm between shifts. With the Fuller ROADRANGER, you can haul more, and maintain higher average speeds than ever before—with so much better utilization of horsepower that you make 1/3 fewer shifts. Write today for full information on the new Fuller R-45 ROADRANGER.

Check These Advantages:

● Easier, quicker shifts—38% steps—one shift lever controls all 8 forward speeds ● No gear-splitting—8 selective gear ratios, evenly and progressively spaced ● Higher average road speeds—engine operates in peak hp range with greater fuel economy ● Less driver fatigue—⅓ less shifting ● Range shifts pre-selected—automatic and synchronized ● More compact than other 8-speed transmissions ● More cargo can be carried on the payload axle.

VITAL STATISTICS

GEAR RATIOS:

Low Range		High Range	
1st	9.78	5th	2.66
2nd	6.98	6th	1.90
3rd	4.99	7th	1.36
4th	3.68	8th	1.00
Reverse	11.01	Reverse	2.99

Installation Length . . . . . 29⅝"
Clutch Housing Sizes . . . . . SAE 1, 2, 3
Weight, with Standard Controls . 457 lbs.

Fuller TRANSMISSIONS®

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT BRANCH (SALES & SERVICE—BOTH DIVISIONS), 641 E. 10th Street, Oakland 6, Calif.

Your P&H dealer

Not for years has there been such an important announcement to shovel users! It's the new, lower prices on P&H machines — the most advanced,

Ask him about . . .

MODEL 55

MITI-MITE

7-ton capacity as a crane.

The simplest, huskiest little truck crane ever built! Power box transmission reduces usual maintenance worries to a simple oil change twice a year! Fully convertible: 11 cu. ft. capacity as shovel, dragline, etc. Here's more production ability . . . to earn more money for you . . . and prices which can't be beaten in the industry.

MODEL 105 10-ton capacity.

Offered on its own P&H-built carrier. The Model 105 is the most powerful, most rugged of all small truck cranes — and offers the largest capacity. Fully convertible . . . and loaded with modern refinements which make it a more versatile money earner on a wider range of jobs.

has big news for you!

finest-performing power shovels and cranes ever built!

P&H's growing volume — larger production — make possible these sweeping cost reductions. Your P&H dealer has full details on the size and type of machine you need. See your nearest P&H dealer, now!

the features, the values, the prices!

Compare P&H's advanced features with everything on the market — for easy operation, for ruggedness, for low maintenance costs. Think of P&H's greater stability that lets you make more effective use of engine power — that lets you put "more on the hook" with less danger of tipping. These are some of the features that give you greater work capacity — more earning power. P&H performance is far ahead of those with 15 and 20 year old hold-over designs.

Yes, P&H gives you the features — and the new low prices that mean greater values. Here's the sound investment that pays off faster . . . puts more money in your pocket, sooner. Prove it to yourself! See your nearest P&H dealer for full details and prices.

P&H POWER SHOVELS AND CRANES

HARNISCHFEGER CORPORATION

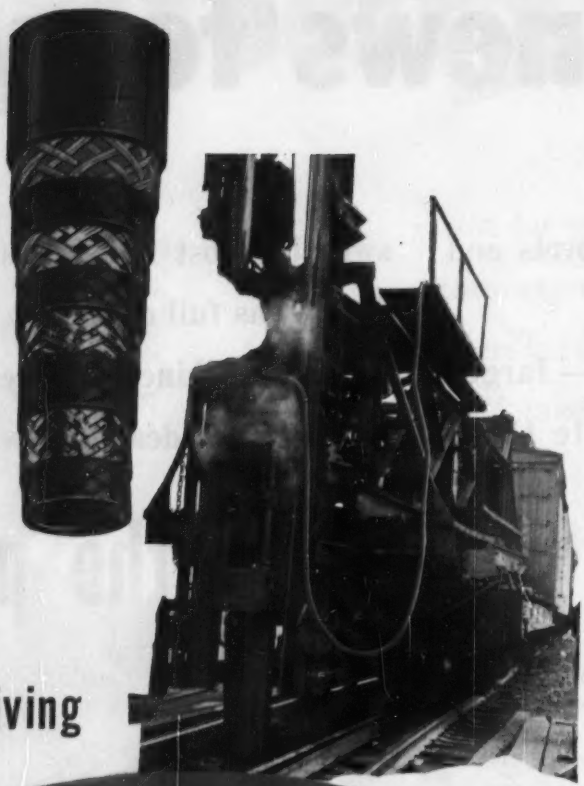
Milwaukee 46, Wisconsin

MODEL 255-A ¾ yd. capacity.

A great machine made even greater with 22 design advancements. It's another remarkable example of advanced design, modern engineering and outstanding features at prices no higher than old, hold-over designs. Many standard P&H items are "extras" on other machines!

See your P&H dealer . . . today!

Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps every P&H job moving on schedule. Your P&H Dealer is tops in the business.



Takes the Drive in Piledriving

Quaker

IRONSIDES
PILEDRIVER HOSE

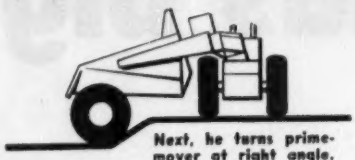
Here is a lightweight, flexible hose that offers definite assurance of longer service plus extra safety. Specifically made for rugged piledriver use. Built-in, triple braid steel wire armor stands up to high pressures. Glass braid for insulation and extra strength. Tube resists damage by oil. Won't collapse, or separate from rugged abrasion resistant cover. For the hose that takes temperatures up to 388° F., plus all the twisting, dragging and crushing you can give it—specify Ironsides—another Quaker quality product for extra stamina, service and savings.

Write for name of nearest distributor

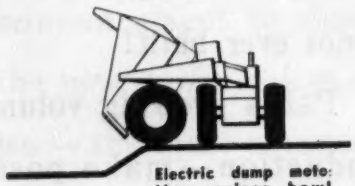
Belting, Hose, Packing and Moulded Rubber of every construction for every need.

QUAKER RUBBER CORPORATION
DIVISION OF H. K. PORTER COMPANY, INC.
OF PITTSBURGH
PHILADELPHIA 24, PA.
Branches in Principal Cities

JOB TALK . . . Continued from page 20

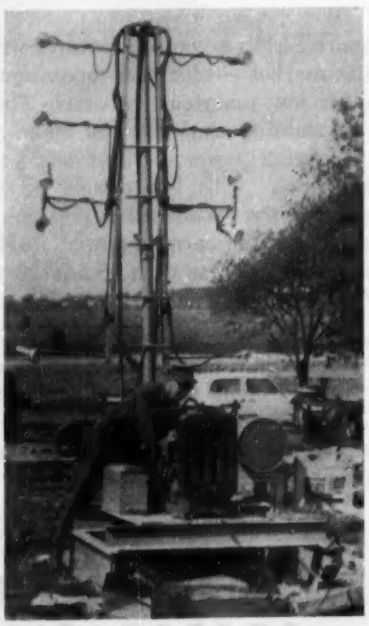


Next, he turns prime-mover at right angle, sets front brakes, releases rear-wheel brakes.



Electric dump motor then raises bowl, shortening wheelbase and drawing rear wheels up and out of hole to solid ground.

the haul unit, causing the free-wheeling rear wheels to be pulled forward and out of their holes.

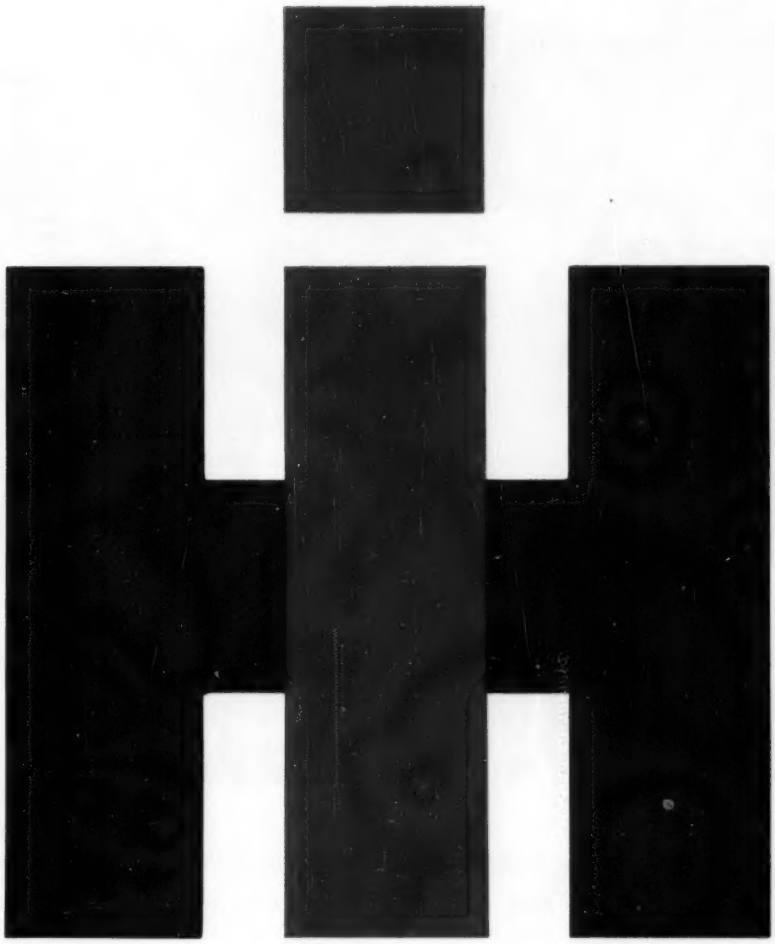


Portable Lights

Plenty of light is available in any direction and at any spot on the project when this portable light tower goes to work. A tubular mast supports 10 lamps on two cross-arms hinged to make the unit more compact for moving and maintenance. Crossarms are shown in the "down" position. Steel mast has welded rungs for quick servicing, and individual lamps have swivel mountings for proper aiming at night.

Power comes from a Kohler electric plant, and the whole rig is

(Continued on page 34)

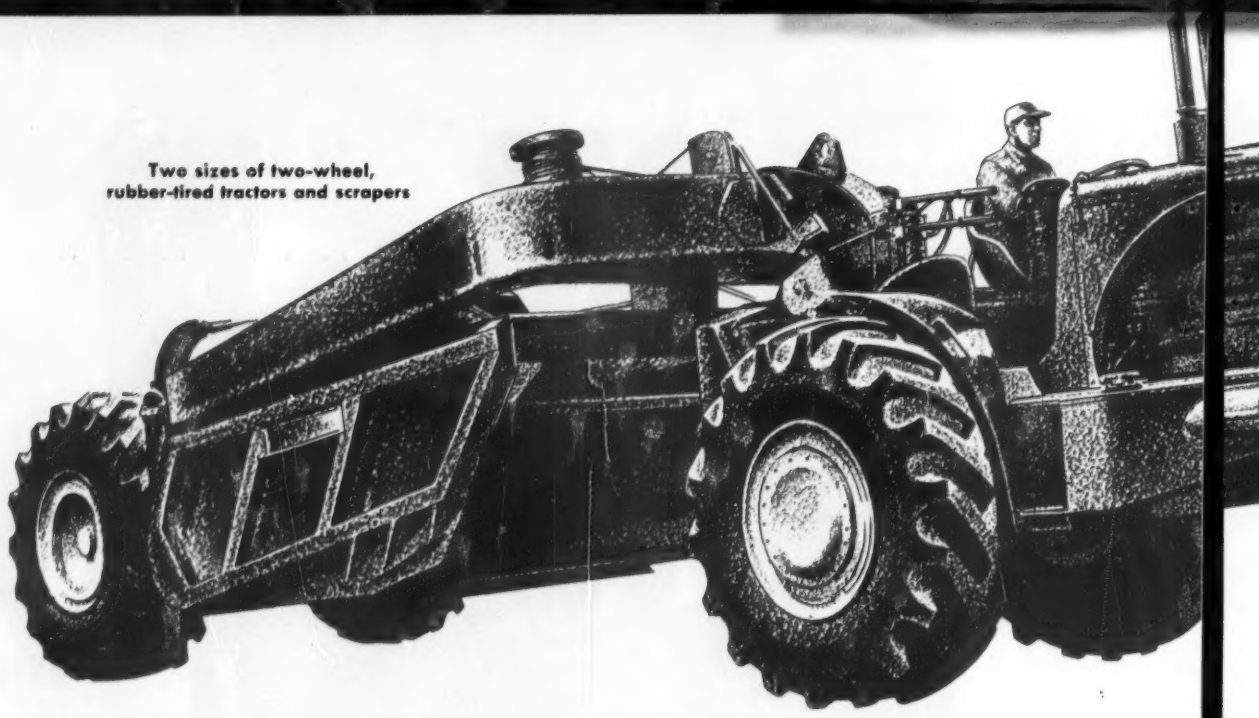


International Harvester and INTERNATIONAL Industrial Distributors present a complete line of modern earthmoving equipment, led by the INTERNATIONAL two-wheel, rubber-tired tractors with scrapers, and by "Big Red," the INTERNATIONAL TD-24, world's most powerful crawler

INTERNATIONAL HARVESTER

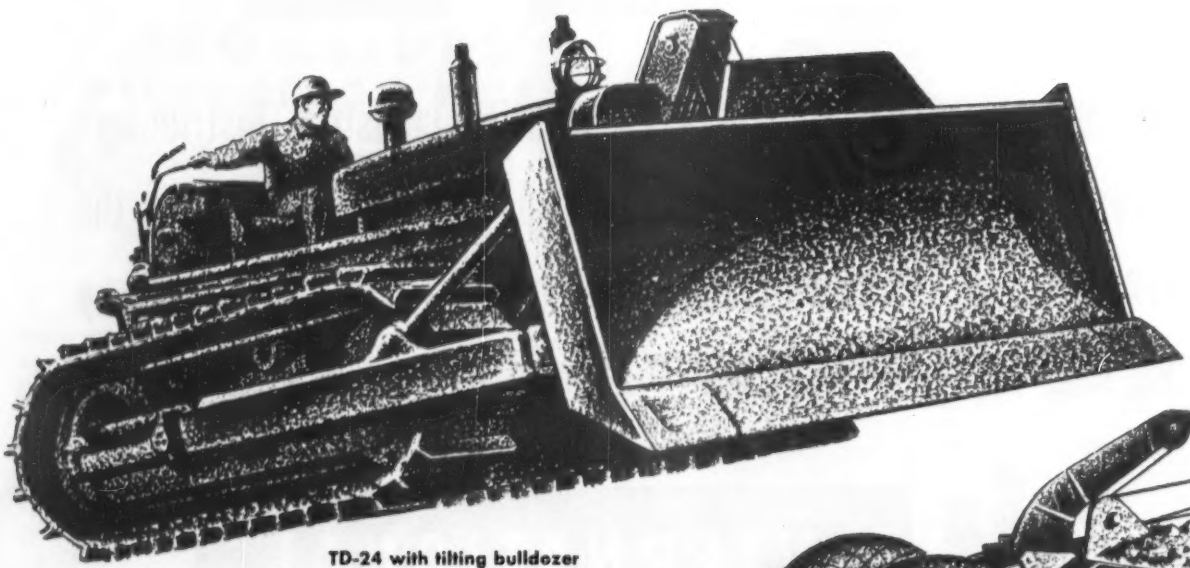
INTERNATIONAL

POWER TO MOVE THE EARTH

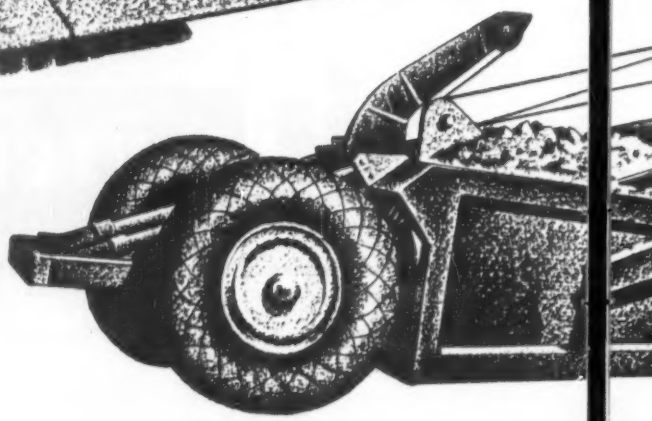


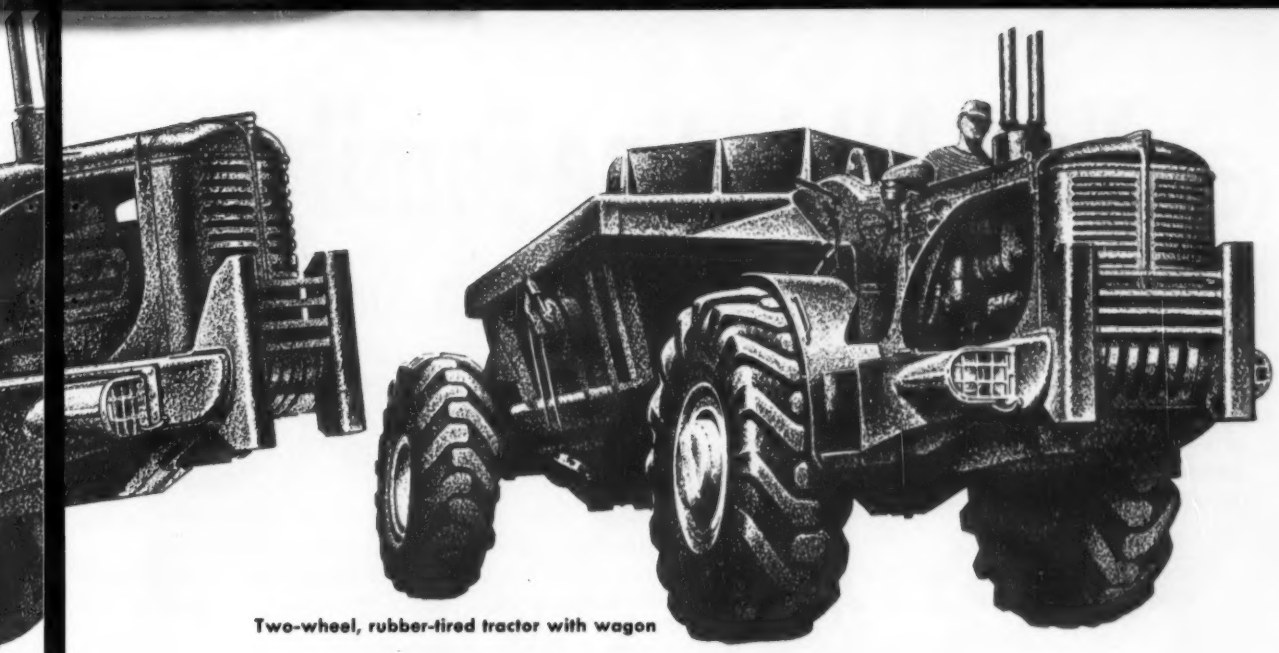
Two sizes of two-wheel, rubber-tired tractors and scrapers

Now a complete earthmoving line that comes in the



TD-24 with tilting bulldozer





Two-wheel, rubber-tired tractor with wagon

Big Red Package

Got a big job to do? Call on INTERNATIONAL'S new Big Red Team!

- Seven rugged crawlers headed by the TD-24—most powerful crawler on the market!
- Twenty-two matching hydraulic and cable-controlled bulldozers and bullgraders, with land-clearing blades available!
- Four 4-wheeled scrapers!
- Two high-speed, two-wheel, rubber-tired tractors with scrapers (13 and 18 heaped-yard capacity)!
- A high-speed, two-wheel, rubber-tired tractor with bottom dump wagon (20 heaped-yard capacity)!

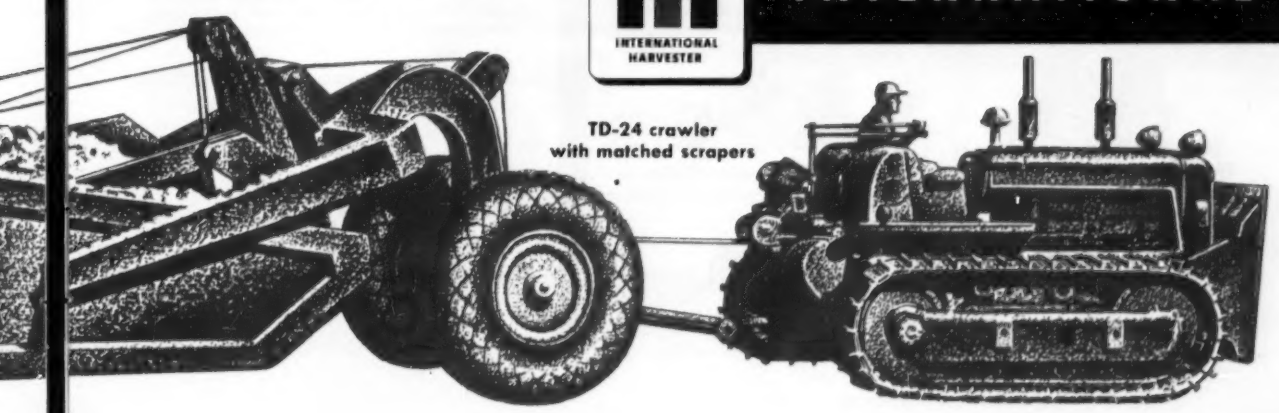
These great machines, now grouped under the INTERNATIONAL banner, have proved their dependability and economy to contractors for years on big projects around the world.

Your INTERNATIONAL Industrial Distributor has the equipment that will help you make a profit on any job you tackle. Call him for full details . . . or for actual demonstrations. See for yourself!

POWER THAT PAYS

INTERNATIONAL HARVESTER

INTERNATIONAL



TD-24 crawler with matched scrapers

Now All in One Family

the hardest-working work teams in the world!

The new INTERNATIONAL team stars not only a full line of rugged red INTERNATIONAL crawlers, complete with INTERNATIONAL scrapers and bulldozers, but also high-speed INTERNATIONAL two-wheel, rubber-tired tractors with scrapers.

This means that now, more than ever, your INTERNATIONAL Industrial Distributor is "Earthmoving Headquarters" for your area. He offers you IH equipment to tackle any job, backed up by unsurpassed service facilities and parts supplies.

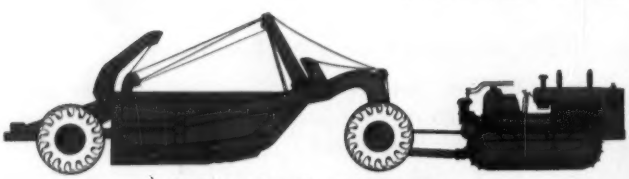
He's at your call, always, to help keep your equipment rolling . . . to cut down your down-time and pile up your profit-time . . . to serve you with INTERNATIONAL "Power that Pays!"

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

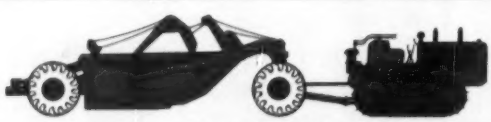
INTERNATIONAL HARVESTER

INTERNATIONAL

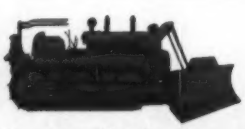
POWER THAT PAYS



TD-24 crawler with matched scrapers



TD-18A crawler with matched scrapers



TD-24 crawler with bullgrader

TD-14A crawler with cable bullgrader

TD-9 crawler with hydraulic bulldozer

T-9 crawler with hydraulic bullgrader

TD-6 crawler with hydraulic bulldozer

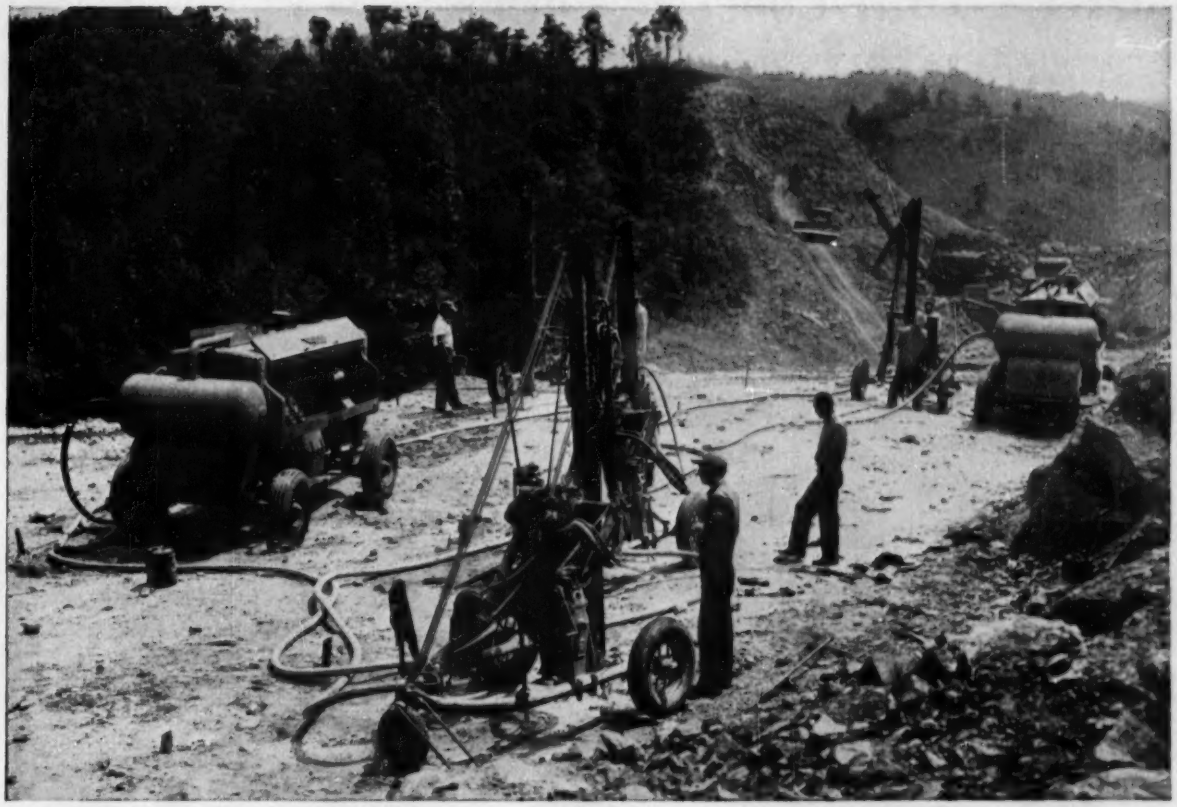
T-6 crawler with hydraulic bullgrader

Model 2T-75 two-wheel, rubber-tired tractor with 18 heaped-yard capacity scraper

Model 2T-75 two-wheel, rubber-tired tractor with 20 heaped-yard capacity bottom dump wagon

Model 2T-55 two-wheel, rubber-tired tractor with 13 heaped-yard capacity scraper

(Advertisement)



Drilling 20-hours a day with Jaeger 600's

Shooting 1,500,000 tons of rock on new West Virginia Turnpike

14 cuts ranging from 30 to 147 ft. deep, a total of 1,500,000 cu. yds. of excavation, 85% of it rock . . . With this contract, H. W. Holt & Son put three 2½ yd. shovels working two 10-hour shifts and set up to drill and shoot 16,000 cu. yds. of rock a day to keep ahead of the shovels.

They chose the most dependable heavy duty drilling equipment yet developed for rock work — ten 4" wagon drills powered by five 600 ft. compressors, four of them Jaeger "Air Plus" units.

Drilling a steady 20 hours a day, in patterns close enough to insure good fragmentation, even cleavage and a minimum of secondary drilling, these "teams" proved able to average the needed yield of 80 yds. per hour per drill.

Over the 88 mountainous miles of West Virginia's Turnpike (a rugged job if ever there was one), the big majority of air compressors of all makes have been 600's, the "new standard" rating introduced by Jaeger in 1946 and later adopted by all others. As yet, Jaeger "Air Plus" are the only compressors *completely engineered* to the other "new standard" ratings — 365, 250, 185, 125, 75 cfm. Like the 600, they meet the higher requirements of today's tools with adequate air, produced at the lowest known cost per cubic foot.

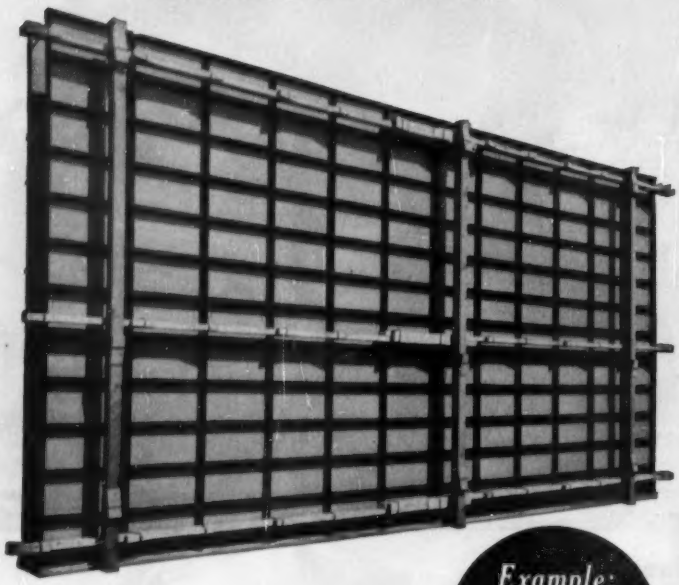
For complete information, see your Jaeger distributor or ask for Catalog JC-1.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

TRACTOR LOADERS • PUMPS • CONCRETE MIXERS • TRUCK MIXERS • PAVING MACHINES

UNI-FORM Concrete Forms GUARANTEE Material and Labor Savings on Your Concrete Jobs!



Example: This wall 24 ft. long x 12 ft. high can be UNI-FORMED for 50% less than with conventional forms.

- ONE SIDE ALIGNMENT and BRACING SAVES UP TO 50% MATERIAL and LABOR
- USE STANDARD LUMBER LENGTHS—NO CUTTING OR FITTING—GET MAXIMUM LUMBER RE-USE
- SIMPLIFIED ASSEMBLY permits inexperienced crews to form fast . . . accurately . . . no waste motion

Universal Concrete Form Specialists will assist your men On The Job TO INSURE MAXIMUM FORMING SPEED . . . EFFICIENCY . . . SAVINGS

RENT with a Purchase Option . . . Try Before You BUY

Write for the new UNI-FORM catalog

UNIVERSAL FORM CLAMP CO.

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SERVICE WHEREVER YOU BUILD . . . COAST TO COAST

DISTRIBUTORS IN PRINCIPAL CITIES

Mr. UNI-FORM

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JOB TALK . . . Continued from p. 32

mounted on a welded steel skid that is towed to location with tractor or truck. The portable, self-contained light tower was built in the shop of D. W. Winkelman Co., Inc., Syracuse, N. Y., contractor, and is in use on his Ohio Turnpike project.

Handy Tractor Shovel Charges Batch Bins

When the Peterson Construction Co. needed 6,000 yd of concrete in the building of the Regis Catholic High School in Eau Claire, Wis., no ready-mix concrete was available in the area.

Peterson purchased a twin-bin weigh-batcher to supply up to 148 yd of aggregates per day. Bins were charged with sand and gravel by a Baker-Lull High-Lift Shoveloader. After three months of pouring concrete, the contractor's records showed a saving of $2 per yd over the usual cost of transit-mix.

The Baker-Lull machine also lifted concrete into forms 12 ft high, handled other materials, backfilled, leveled ground and cleaned up around the site.

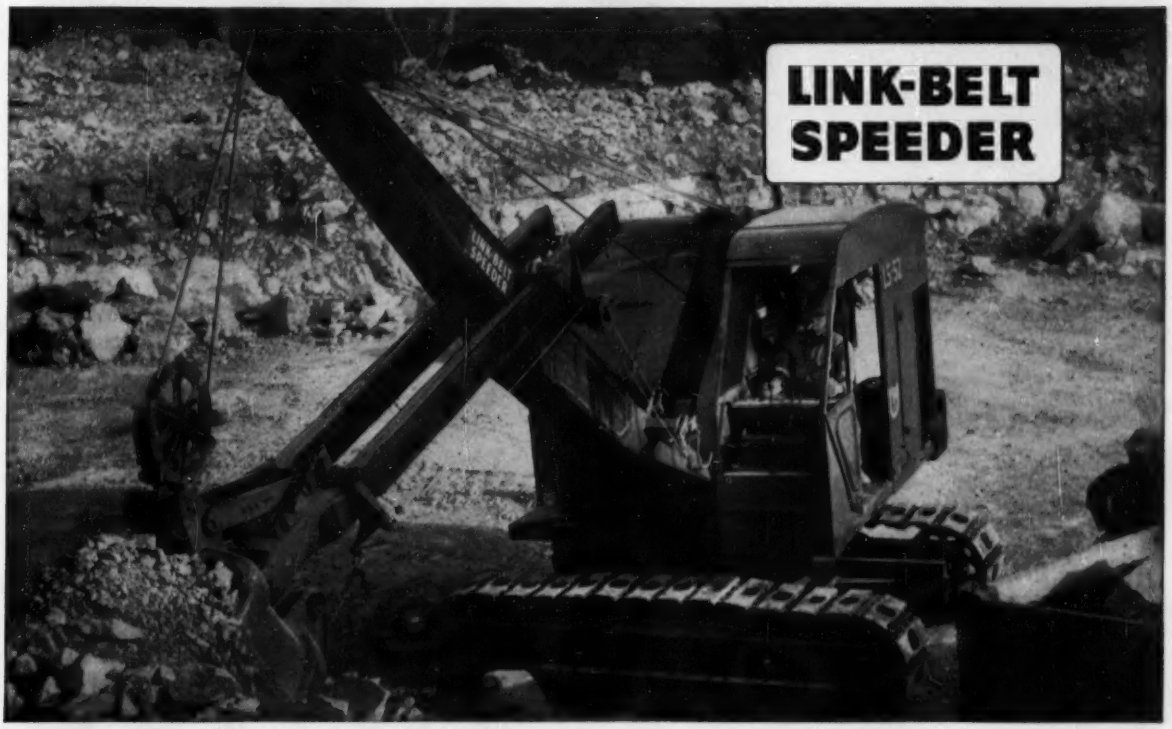
Ripper Saves on Blasting Costs

Turner-Huffman-Pierce Construction Co., Odessa, Tex., realized a tidy saving in blasting costs while laying a 16-in. gas pipeline, 8 mi long, in western Texas. In place of powder, the contractors hooked two International TD-24 crawlers to a heavy single-tooth ripper and tore into the ground, even some hard rock, for all but 1 mi of the line.

Blasting crews removed only the hardest cap rock. The ripping job was so successful that 7 mi of the ditch were dug, with a Cleveland trencher following behind.

Before you buy:

Talk to operators!



Notice the short-throw "Speed-o-Matic" levers. They operate at the touch of a finger.

Operators world-wide prefer the fast, easy, trouble-free *Speed-o-Matic* operation

WENDELL BLAIR, Inkom, Idaho — "... fast, dependable, not a bit of lost time yet."

ROBERT GARNER, Lilbourn, Missouri— "... dependable, accurate, works steady, does more."

LE ROY M. GEORGE, Tipp City, Ohio — "... easy on the operator, smoother, faster and surer."

HOWARD EARL DEGREENIA, Westfield, Mass. — "It doesn't jerk like other rigs I've run."

WITH "Speed-o-Matic" control, operators don't have to fight the rig ... "end-of-the-shift" letdown is minimized. That's why they prefer "Speed-o-Matic" ... why "Speed-o-Matic" means more profit for you.

What's more, these *power-driven* hydraulic controls allow faster passes ... minimize wear and tear ... require far less maintenance than manual, air, vacuum, booster or other control systems ... and provide perfect "feel of the load."

To get all the facts on "Speed-o-Matic" controls and how they increase production, see your distributor or write:

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

13,159

LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...EVERYWHERE

(Advertisement)

Pictures of the month . . . by LeTourneau-Westinghouse

HAULS ON CITY STREETS — C Tournapulls often drive through city traffic on their way from job to job. This unit, owned by Skousen-Hise Construction Company, Albuquerque, traveled 190 miles to Farmington, New Mexico, at road speeds of 30 to 35 mph. The 16-yd "C" also works on city streets. Here, on a road widening job, it is hauling 11 pay yards of sand clay 3 blocks through the center of Farmington. Complete cycle takes 4 minutes. Says Operator C. R. Hendrickson, "I travel continuously at a high rate of speed through heavy traffic, yet (with unit's 4-wheel air brakes) can still stop without trouble at stop signs or to avoid accidents."

1 DOES WORK OF 3 — Repairing washout of a North Dakota road, 7-yd D Tournapull and its one operator handle complete job alone. Self-loading, "D" picks up 5 to 7 loose yds from backslope . . . spreads over soft fill . . . dozes into low spots to raise roadbed above flood level. Average output, 100 yds hourly. Similar job nearby took 3 men and 3 crawlers — one for push-loading, one to pull 18-yd scraper, one for dozing fill.

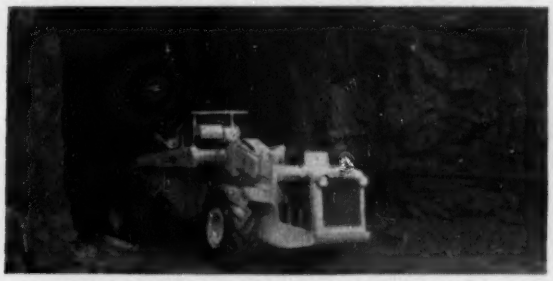
ROLLING GIVES 5½-MIN CYCLE — To take full advantage of their C Tournapulls' 30 mph speeds, Yerrington Constr Co, Parkville, Missouri, rolls, grades and sprinkles haul roads. This careful maintenance pays off always. On this relocation of Rt 32 between Kansas City and Lawrence — good haul roads helped each of their 3 Tournapulls average a 4000-ft cycle every 5½ min.

DOUBLE-DUTY — Vernie Jarl, Gresham, Oregon, by interchanging 18-ton Scraper and Rear-Dump trailing units, works his 4 C Tournapull prime-movers efficiently on both rock and dirt jobs. About Scrapers, Owner Jarl says, "They move dirt cheaper than tractors on any length haul." About Rear-Dumps, his Superintendent, Art Bolder, says, "They're the only rigs that work efficiently in the tight quarters we have here."

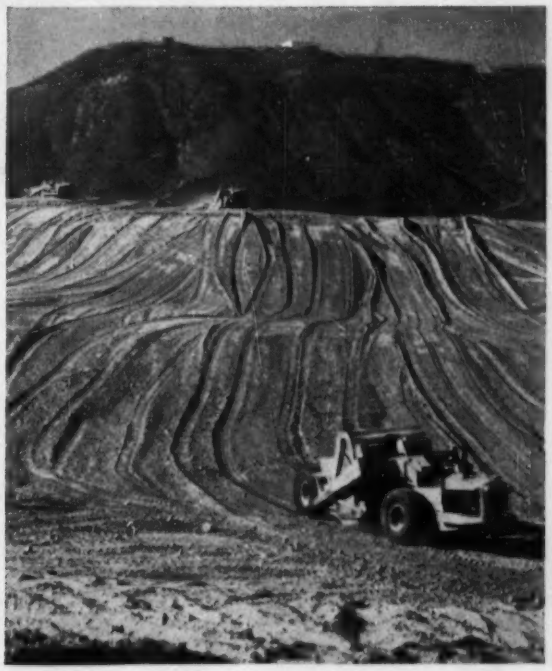
(Advertisement)

. . . with performance reports from around the world

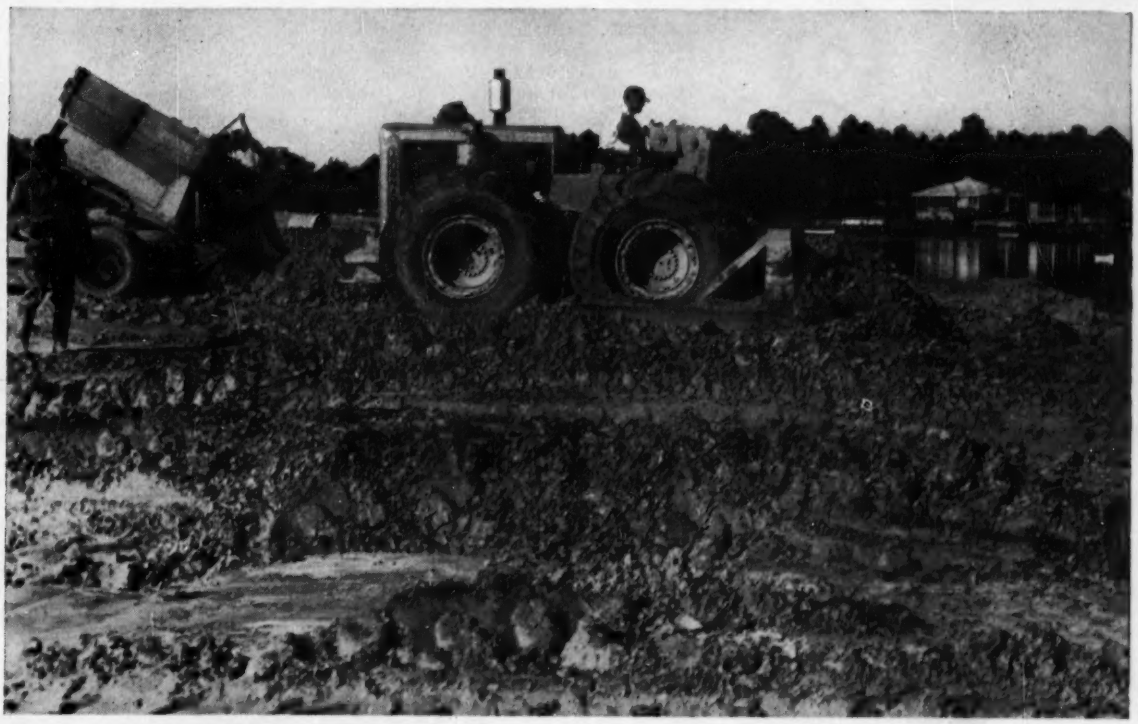
5 YEARS, "NEVER FAILED" — Production is high, downtime low on this Tournatractor owned by Miss. State Highway Dept. Unit delivers sand for 770 tons of asphalt daily on dozing cycles of 600 to 1200 ft. Five years old, it still has 2 of original tires. Says Shop Foreman H. B. Lee, "A lot depends on continuous operation of our Tournatractor. It has never failed us."



4 MILES FROM ARCTIC CIRCLE — At Jumisko, Finland, 6 Tournarockers are hauling 400,000 yds of granite to excavate 4 miles of tunnels for water power. Winter temperatures drop to 40° below, but units operate 24 hours a day. With 13 ft 9 in. turn radius, they maneuver easily in the 20 ft tunnels.



2250', 4.7 MIN — Malcolm Paving Company's 5 C Tournapulls traveled fast down 23% grades to level 192,000 yds for a cemetery addition. Complete 2250 ft cycle took 4.7 minutes. Contractor estimates each Tournapull hauled 10 pay yds of volcanic sand per load, delivered 10 loads per hour, 1000 pay yds per day.



IN A SEA OF MUD — This material being used to build a 115,000-yd bridge approach at Pass Christian, Mississippi is so sticky that trucks sometimes have to be unloaded by hand. Units on job include 5 crawler-tractors ranging from 48 to 163 hp, plus a 186 hp Tournatractor. Dozing fill and grading the roadway, this rubber-tired tractor works so well that R. J. Noland, Job Supt for Southern Foundation Contracting Company of New Orleans, declares "Tournatractor will move twice as much dirt as any crawler equipment." For more information on Tournatractor and other tools shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Ill.

Tournarocker, Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic-556-C

▲**CP-365 REVERSIBLE AIR IMPACT WRENCH**—Ideal for fast, efficient structural bolting up and for maintenance of heavy construction equipment. Cuts nut running time in half. Handles nuts and bolts to 1¼" bolt size.

cost-cutting equipment

that really pays off

CP PORTABLE AIR COMPRESSOR AND G-300 WAGON DRILL—This economy-minded, diesel-driven CP Portable Air Compressor supplies air for the readily adaptable G-300 Wagon Drill equipped with a hard-hitting 70-NDC Drifter. Gradual Speed regulation of the compressor governs engine speed to conform to air demands to save fuel and reduce engine maintenance.

▲**CP DEMOLITION TOOLS**—Afford the maximum penetration that makes quick work of the toughest jobs. CP's complete line makes it possible to select the model most economical for each job. Capacities range from the CP-111 (25 lb. class) to the CP-117 (80 lb. class).

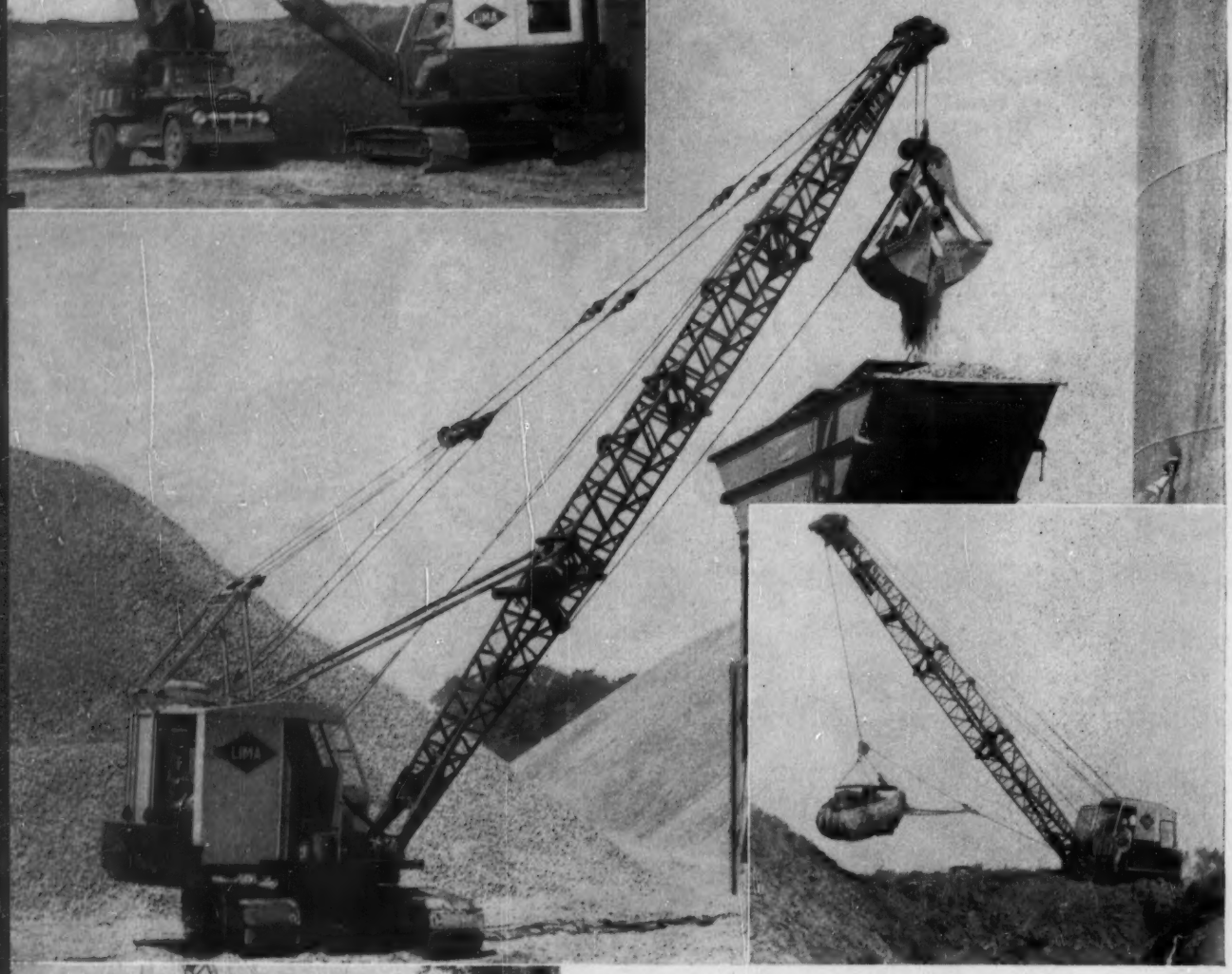
Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Round and Round They Go

Concentric rings of falsework 50-odd ft high fall into place easily, as practiced carpenters bring in lumber and lift it to working levels with a power hoist on their rolling tower that is pushed around the perimeter as the wooden "jungle gym" grows. This is standard procedure for the Preload Construction Corp. during the construction of a large prestressed concrete tank. Concrete for the tank floor and wall footing has been poured, and workmen benefit through easier erection on the smooth, solid surface. This picture was taken during construction of two 5,000,000-gal prestressed (vertically and horizontally) water tanks at North Wayne, Pa. A feature article in this issue describes the big 25-week job in detail by pictures and text and shows how the falsework was used to support metal wall forms and wood forms for the domed roof, built up with pneumatic mortar. Preload states that prestressing these 125-ft dia concrete tanks saved 3,000 yd of concrete and 400 tons of reinforcing steel against similar tanks constructed of reinforced concrete.

LIMA



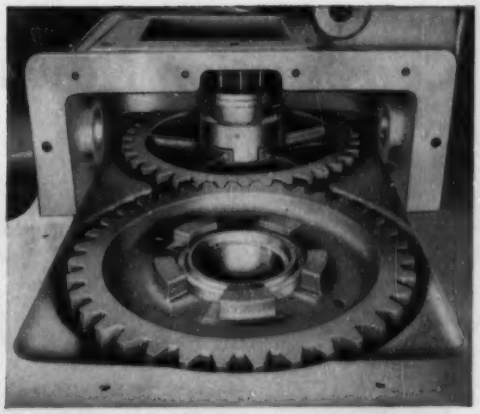
To meet the need for a 25 ton crane and 1 cubic yard shovel, Baldwin-Lima-Hamilton Corporation, is now producing the LIMA Type 44. As a shovel, it is equipped with 20 ft. boom and 15 ft. dipper handle. This latest addition, fills an important spot in the LIMA line, between the famous Paymaster (17½ ton crane—¾ yard shovel) and model 604 (35 ton crane—1½ yard shovel).

Like its smaller brother, (Paymaster, Type 34), the LIMA Type 44 is available, with either crawler or rubber mountings. Wider, longer crawlers for greater stability and double sets of front cone rollers, to distribute the load more equally over a wider area, are some of the major design features.

For your copy of our Type 44 bulletin, please contact your nearby LIMA distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Type 44 ANSWERS DEMAND for one yard shovel and 25 ton crane

LIMA incorporates many quality features in versatile shovel—crane—dragline—pull-shovel and truck crane.



Propel and swing gears are enclosed in an oil bath, assuring smooth, quiet operation.

COMPARE! No other machine gives you as much as LIMA!

1. Big capacity drums and sheaves lengthen cable life, by reducing the need for double wrapping and sharp bends in cable.

2. All gears, smaller parts and shafts which are subject to extra wear, are flame or induction hardened for longer life.

3. Main machinery is placed well back of center of rotation, to eliminate excess counterweight.

4. Propel and swing gears and power take-off, are enclosed in sealed oil bath for dirt elimination and smoother, quieter operation.

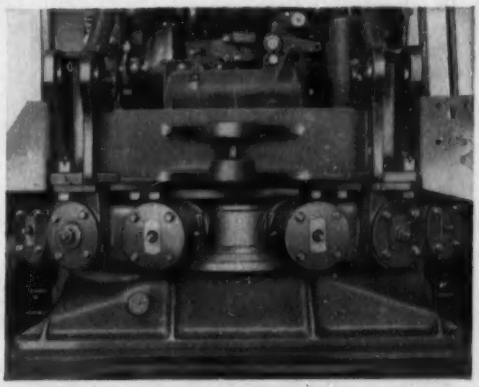
5. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.

6. Bronze bushings in tread, idler and drive rollers, are protected by piston-type dirt seal rings and retainers.

7. Torque converter (optional), automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.

Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts, to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels, (¾ cu. yd. to 6 cu. yds.), cranes, (to 110 tons) and draglines (variable).



The conical rollers are the hook type, four in front and two in the rear. The four front rollers are arranged in pairs and each pair is mounted in an equalizer frame.

An extra long Crawler (15'-0" long, 10'-8" wide), is available for work requiring greater stability.

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

LIMA

SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

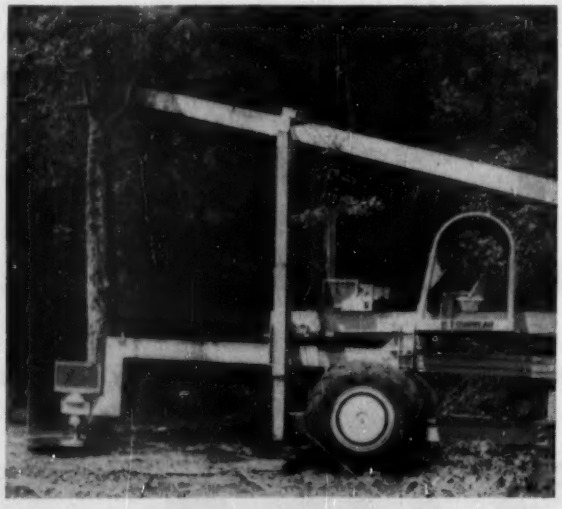
BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Construction News in Pictures . . .

HIGH-PRODUCTION TEAM—Siamesed Caterpillar D8 crawlers march along easily with a Euclid elevating loader in tow excavating in an area along a section of the Ohio Turnpike at Petersburg. Fill is pouring into a Euclid bottom-dump. Equipment is owned and operated by Harrison Construction Co., Pittsburgh, Pa., contractor on this section.—John Krill photo

CONTRAST ON THE FILL—Both big and little machines have their uses while grading for the Ohio Turnpike south of Youngstown. The D. W. Winkelman Co., Inc., of Syracuse, has a Ford wheel tractor pull a double-disk harrow across the fill, both dwarfed by two double-drum sheepsfoot rollers and Caterpillar D8 crawler doing the compacting.—John Krill photo

MAIN LINE SQUATTER—This outmoded concrete coal chute accidently dropped squarely across the Rock Island Railroad near Morris, Ill., when engineers dynamited its piers to topple it to one side. Traffic was halted for 12 hr.—UP photo



MONSTER TREE SAW—Tournasaw, manufactured by R. G. LeTourneau, Inc., Longview, Tex., is all-electric drive and steer, has 6-ft blade that can reach out 16 ft and an overhead boom to topple trees in direction desired. *(Continued on page 47)*

New 1954 Chevrolet Trucks

New Power! New Economy! New Features you want!

New Chevrolet trucks for '54 are here to do your hauling or delivery job faster, more efficiently and more economically.

To begin with, they bring you thrifty new power in *all* models. You save time on every trip with extra reserves of high-compression horsepower under the hood—and you enjoy greatly increased operating economy as well.

In addition, these great new Chevrolet trucks offer new and even greater dependability with increased ruggedness throughout the chassis. You'll find heavier axle shafts in 2-ton models . . . bigger, more durable clutches in light- and heavy-duty models . . . more rigid frames in *all* models. Pickup and stake bodies are plenty rugged, too—and they're roomier for '54!

But that's only the beginning! You enjoy new cab comfort, convenience and safety. Instruments are easier to read . . . controls are easier to reach. A new one-piece curved windshield gives you greater visibility. The new Ride Control Seat* lets you drive in relaxed comfort hour after hour, over all kinds of roads. Seat cushion and back move as a unit to "float" you over bumps without back-rubbing.

In another great advance, new Chevrolet trucks offer you the last word in no-shift driving ease and convenience. With proved truck Hydra-Matic transmission* you can drive all day and make door-to-door deliveries without shifting or clutching. Fact is, there *is* no clutch!

These are some of the many big new benefits awaiting you in the new Chevrolet trucks for '54. Why not plan to get the whole money-saving story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Most trustworthy trucks on any job!

CHEVROLET

ADVANCE-DESIGN TRUCKS

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance. *Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE!

(Advertisement)

Help for Contractors in the bidding... and on the job

IN the past 15 to 20 years, the construction industry has kept earth-moving costs down in spite of rising labor and material costs. To do it, construction men have pioneered new earth-moving techniques that have put constantly increasing demands on machinery. That's why in today's tough competitive era a man needs modern equipment that gives him a versatile outfit, easy to move from job to job . . . equipment that enables him to bid successfully and work at a profit.

In an effort to cooperate fully to meet these demands, Allis-Chalmers has for years geared its progress to that of the earthmover himself . . . now offers him completely new designs like the HD-15 . . . a machine that takes advantage of even the most recent developments in tractor application.

The design of the HD-15 also makes full use of new metals, new oils and greases, and the latest manufacturing processes. Existing models were not allowed to restrict Allis-Chalmers engineers . . . so they worked right from the ground up, matching part to part, assembly to assembly, and the entire tractor to its Allied equipment. As a result, the HD-15 offers new standards in ease of operation and service, as well as long-life performance. With outstanding balance characteristics, it handles both mounted and drawn equipment well, provides maximum flexibility for the wide variety of jobs so typical of today's construction work.

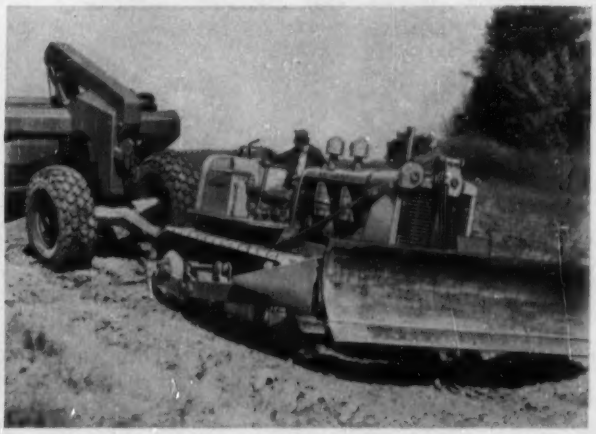
And as earth-moving competition gets keener, these design advantages become more and more important to you. We invite you to talk with your nearby Allis-Chalmers dealer to compare values . . . see for yourself how the HD-15 can be a big factor in helping you to win bids, stay on schedule and make a profit.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

HD-15
109 drawbar hp.
27,850 lb.
Six speeds forward to 5.8 mph.
Three reverse speeds to 4.5 mph.

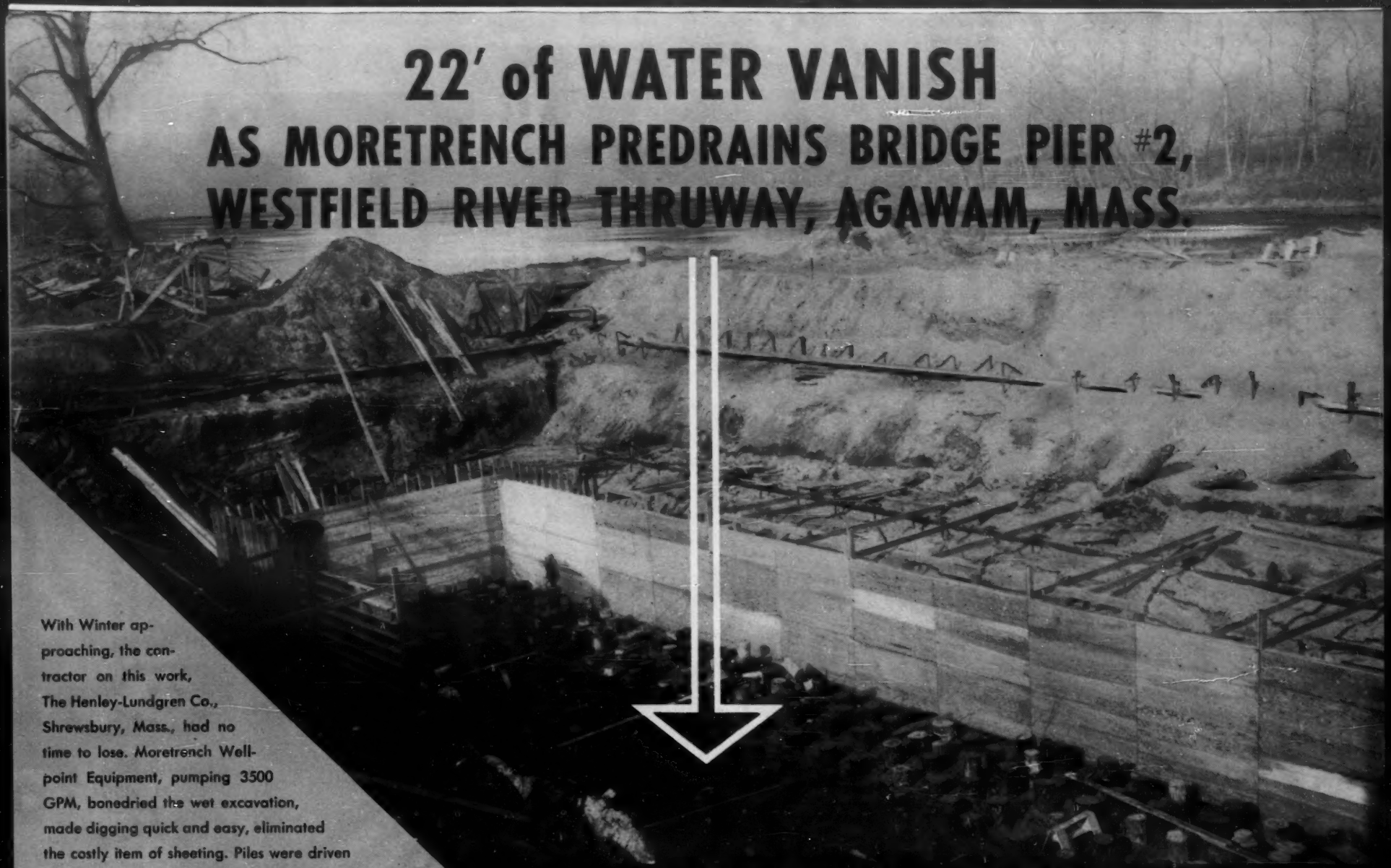
Constant progress in earth-moving methods has been matched by such design advances as this HD-15 and its engine-mounted dozer . . . which were engineered and tested as a unit, right from the start.

This HD-15 Tractor Shovel is a tool which introduced a new era of tractor usefulness . . . let contractors move from job to job easily and do traditional jobs in a better, faster way.



The improvements and refinements of really modern design take on new significance as competition gets keener. Extra yardage handled . . . or lubrication time saved means working more efficiently, more profitably.

22′ of WATER VANISH
AS MORETRENCH PREDRAINS BRIDGE PIER #2, WESTFIELD RIVER THRUWAY, AGAWAM, MASS.



With Winter approaching, the contractor on this work, The Henley-Lundgren Co., Shrewsbury, Mass., had no time to lose. Moretrench Wellpoint Equipment, pumping 3500 GPM, bonedried the wet excavation, made digging quick and easy, eliminated the costly item of sheeting. Piles were driven and foundation poured in record time at a considerable saving.

We'll be glad to explain how you can speed progress, cut costs on your wet work. Call our nearest office.

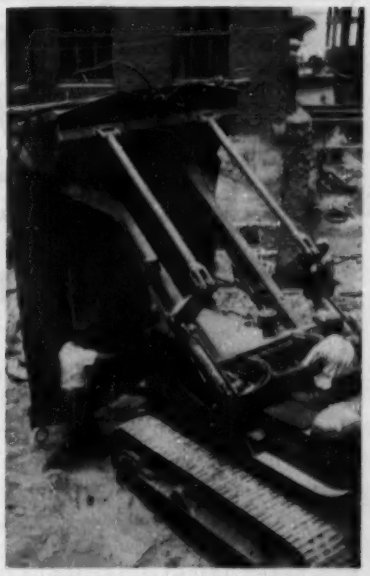
MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

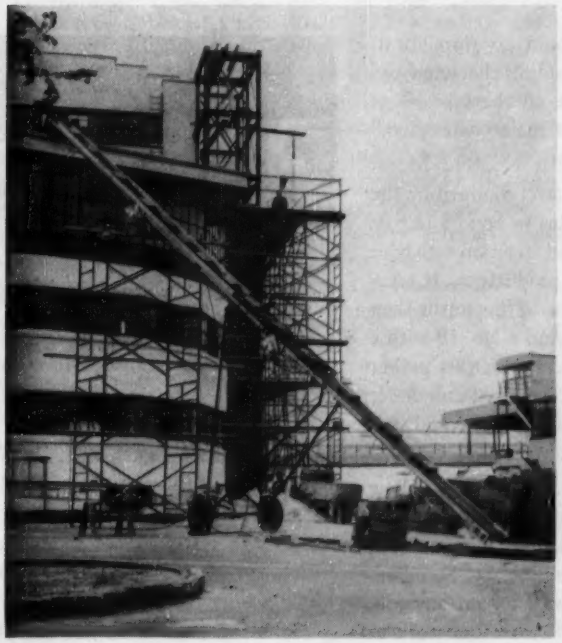
Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

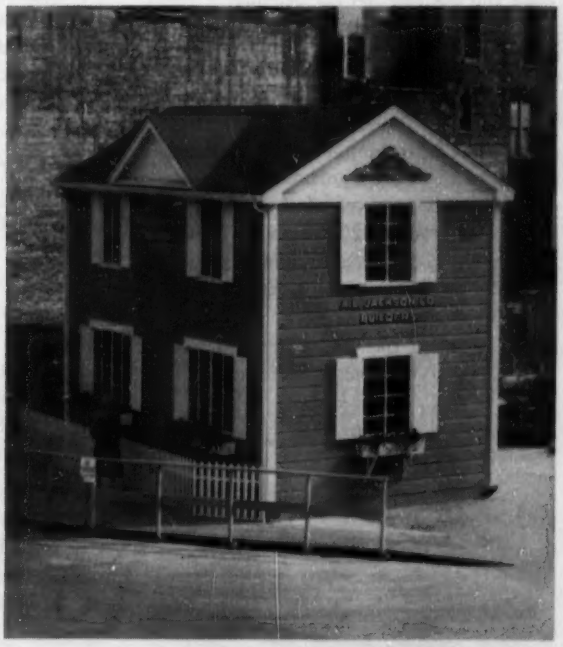
STUDS DO DOUBLE-DUTY— On the construction of the multi-million dollar Parma High School, Parma, Ohio, Ramset Tru-Set threaded studs are used in a double-duty job. The studs are set into the concrete at the required locations, a nut lightly threaded on under the frame and the frame set in place. Then simply by raising or lowering the nut, the frame is carefully plumbed and shims inserted for final positioning. The holding nut is then threaded down tightly above the frame, anchoring the frame to the slab and at the same time holding it in the correct position. A Ramset Jobmaster Model 122 was used on this job.



MOVES MAT AND MUCK— After this Allis-Chalmers HD-9 Tracto-Shovel places wire-rope blasting mat, shot will be fired and rock mucked without disturbing building immediately alongside. Ingram & Greene Inc., New York contractors, rigged versatile machine for excavating 18x50-ft foundation pit 11 ft deep.



ODDS REDUCED AT THIS TRACK — The odds went way down when this contractor combined three separately powered 20-ft Brik-Toter conveyors to erect a 60-ft conveyor to reach a 35-ft level on the grandstand of the Narragansett Race Track in Rhode Island. The conveyors handled all mortar block, lintels and other materials used in construction of building shaft for a higher roof. Conveyors were installed by cranes already on job. Arrangements saved contractor more than 50% in handling costs.



A CONSTRUCTION SHANTY?— Doll House but life size could well describe this construction "shanty" built by A. L. Jackson, builder of Chicago, Ill. on a construction job for the First National Bank of near-by Evanston. The model house is complete with window boxes, shutters and even has a small white picket fence. The unusual two-story structure erected on the edge of the scar of an open excavation has been a daily challenge to the construction workers to match it with neat housekeeping.

Big yellow units teamed up on Trans-Canada Highway relocation job

Blind curves, roller-coaster hills, frost boils and breaks once made travel hazardous and unpleasant for motorists on No. 17, between Nairn and Whitefish, Ontario. Today, drivers find its nine-mile relocation safe and easy going. Part of Ontario's 1400-mile contribution to the Trans-Canada Highway scheme, the new stretch involved 670,000 cu. yds. of excavation, as follows: 270,000 of earth, 200,000 of rock and 200,000 of "granular material" fill. Contractors on the project: Ellins Construction Ltd., Toronto, who relied heavily on Caterpillar* equipment to push the job through on schedule.

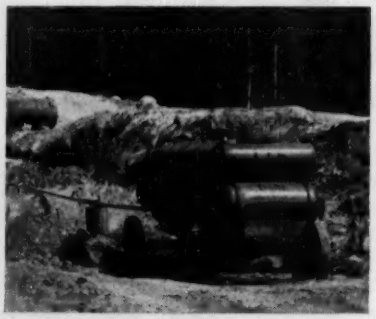
Big tires float the Cat DW10 Tractor-No. 15 Scraper unit over loose stuff as it's push-loaded by a D8 on a nine-mile relocation of highway between Nairn and Whitefish, Ontario.

Prime machine in moving gravel fill for the finished grade was the Cat* DW10 Tractor with No. 15 Scraper. On a one-mile round-trip haul, this unit made four trips an hour with 19- to 20-ton loads. Average production daily: 1000 tons. On shorter hauls, the unit chalked up 1500 to 2000 tons production daily. The rig was push-loaded by a D8. Commenting on performance, Master Mechanic G. Vaughan said: "The gravel in the pit was extremely loose. The DW10s were about the only machines that would go through it. They have good loading characteristics—and the ejection on the No. 15s is clean and fast. Good maintenance, too."

The blade stays where it's put—one of many advantages of the sturdy No. 112. More than 99% of Caterpillar Motor Graders ever built are still working.

Of the Caterpillar No. 112 Motor Grader handling gravel dumped by the DW10s, he had this to say: "I like its power, weight and traction—they're balanced for good production. It takes more punishment with less repair than any other make." And a No. 12 with a bulldozer attachment won this praise: "It's strongly built—it stands up under a beating. Visibility is good and mechanical controls stay put."

In addition to these tough yellow units, Ellins Construction used a D7, a D4, also a D13000 Engine in a Gardner-Denver compressor. Standardization like this pays off on any job, routine or rough, with more work at lower cost and less down time. Operators and mechanics get to know one make well. As a result, operators push through more production with less



This Gardner-Denver compressor is powered by a Cat D13000 Engine. Honestly rated, sturdy yellow engines deliver all the power they promise in the spec sheets.

effort, and fuel, too. All Caterpillar-built units burn low-cost No. 2 furnace oil without fouling. And prompt, one-stop service from one dealer, your Caterpillar Dealer, is another factor in keeping costs down and production up.

He is the man to see for complete facts on the advantages of standardization. He'll be glad to demonstrate Caterpillar equipment at your convenience on your job. Call him today.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS, U. S. A.

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(Advertisement)

January 1954 • Volume 36 • Number 1

CONSTRUCTION METHODS AND EQUIPMENT

Coming Up: More and Better Roads

ROADBUILDING is the brightest spot in the whole construction picture today, both for the immediate future and the long-time outlook. For 1954, estimates point to an expenditure of nearly 3½ billion dollars for highways, an increase of 10% over 1953. For the long pull, road construction prospects are even more encouraging for at last the American public shows signs of awakening from its lethargy toward highways.

The shocking toll of death and bloodshed on our roads and streets is blasting a glimmer of understanding into the public's indifference. The fine promotion and education efforts of firms like General Motors, Caterpillar, Ford and Goodyear, and of associations such as ARBA, AGC, AASHO and PAR are just beginning to take effect. This growing awareness of the need for highways is most promising, for only through an aroused populace will we ever begin to produce an adequate road system.

Public demand will determine the size of the highway program to come. Its speed will be regulated by a combination of funds made available and engineering and construction efficiency to keep costs down and stretch dollars into more miles of road. Here is a job for the entire roadbuilding industry—administrators, engineers, contractors, and equipment and material interests. Possibly the asphalt and portland cement producers might spend even more of their energies in trying to develop better roads at lower costs instead of publicly clawing each other to pieces.

Turnpike and superhighway construction will be unusually active in 1954, especially in Ohio, California, New York, New Jersey, Pennsylvania and West Virginia. Toll roads also may get under way in Indiana, Florida and possibly other states. Such projects are both huge and spectacular, requiring lots of equipment and materials, and plenty of roadbuilding and construction savvy. The superhighway plan for main trunk routes is spreading to almost every state in the union, and this type of road construction looks promising for many years to come.

But it is the thousands of miles of unspectacular streets and roads built and improved every year that make up the bulk of the highway construction market. They, in the aggregate, take more equipment, more materials, and more labor than do the big jobs.

For some time to come the contractors will keep highway construction costs down through sharp competitive bidding, ever-increasing efficiency through closer supervision, better planning and use of new equipment. Already on the turnpikes under construction today the contractors are trying out new tractors, rollers, scrapers, asphalt and concrete equipment.

If roadbuilding is ever to catch up to demands and needs—and we are certain that day is coming—highway construction must double and even triple its present rate of activity. What then? The roadbuying public will expect, and be entitled to, even more for its construction dollars. This means lower costs, and substantially lower costs can come from only a complete new concept in highway building involving new techniques, new processes and equipment, perhaps even an entirely different use of present materials.

For example, the limit has been reached in production of concrete slabs with present batch pavers. The machines can't be made larger and still travel on the subgrade or shoulder, nor can more of them be concentrated at the forms. How about the possibilities of continuous mixing at the forms with materials supplied by a fleet of light trucks or a belt conveyor?

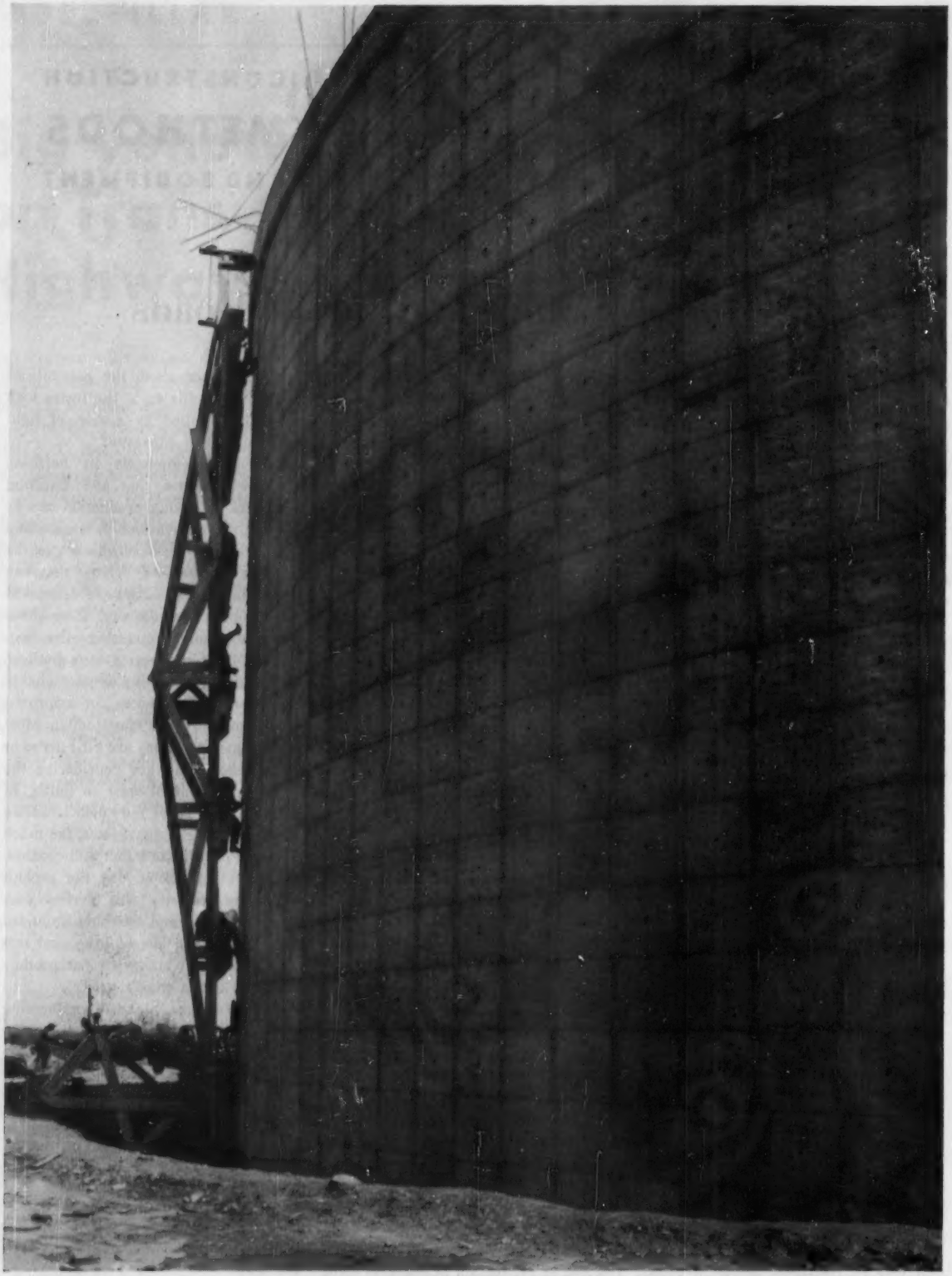
Current developments in finishing machines indicate that the finishing bottleneck to paving production can be licked. Or how about belt or truck dump body delivery of concrete mixed in the portable high-capacity plants that can be knocked down, moved and erected in a few hours, even minutes? How about precasting and prestressing—the fast-growing boys in concrete construction?

Asphalt road building offers probably even more opportunities for improved techniques and faster construction. Most bituminous operations are pitifully slow and cumbersome when considering the entire process from start to finish. In general, there is far too much handling and rehandling of aggregates, too much trying to coordinate batch and continuous operations. Some day the asphalt equipment industry will perfect continuous placing and finishing units fed by a continuous flow of processed materials that will make present production look like a snail's pace.

And, of course, highway engineering must keep up with construction improvements if roadbuilding is to expand. Perhaps this is the greatest obstacle to overcome, in light of certain present advancements in technique and equipment being prohibited by stubborn engineers who close their minds to progress.

Surely, possibilities in road building offer the greatest challenge before the construction industry today. Let's all get busy.

Rich



Five men on rolling truss snap off form ties along poured wall before...

Huge Concrete Tanks Are Prestressed

PRESTRESSED CONSTRUCTION of two concrete water tanks 125 ft in dia, with a liquid depth of 54 ft, saved 3,000 cu yd of concrete and 800,000 lb of reinforcing steel when compared with materials needed to build similar tanks with reinforced concrete.

Preload Construction Corp., New York, came up with these figures after completing two 5,000,000-gal storage tanks for the Philadelphia Suburban Water Co. at North Wayne, Pa. Tank walls are 17 in. thick and are prestressed vertically, as well as circumferentially with the Preload machine method. Tank domes are 2½ in. thick, built up with air-placed concrete shot around reinforcing mesh.

After the site was excavated, a 6-in. course of crushed stone was laid for the sub-base, ½-in. round reinforcing bars placed 8 in. each way and the screeds leveled for an 8-in. floor slab.

Foundation-Wall Keyway

Wall foundations are poured 20 in. thick and about 13 ft wide to spread the weight of wall and dome over a large area. Floor and foundation concrete—540 yd per tank—were placed in one continuous pour to avoid construction joints. A keyway 2½ in. deep and 21 in. wide was formed into the foundations to receive tank walls, and a continuous rubber water stop was set in each keyway to lie in the center of the wall.

Concrete for wall foundations was chuted directly from transit-mix trucks unloading from the perimeter of the excavation. Floor concrete also was delivered by truck but was placed with a concrete bucket swung from the boom of a truck crane.

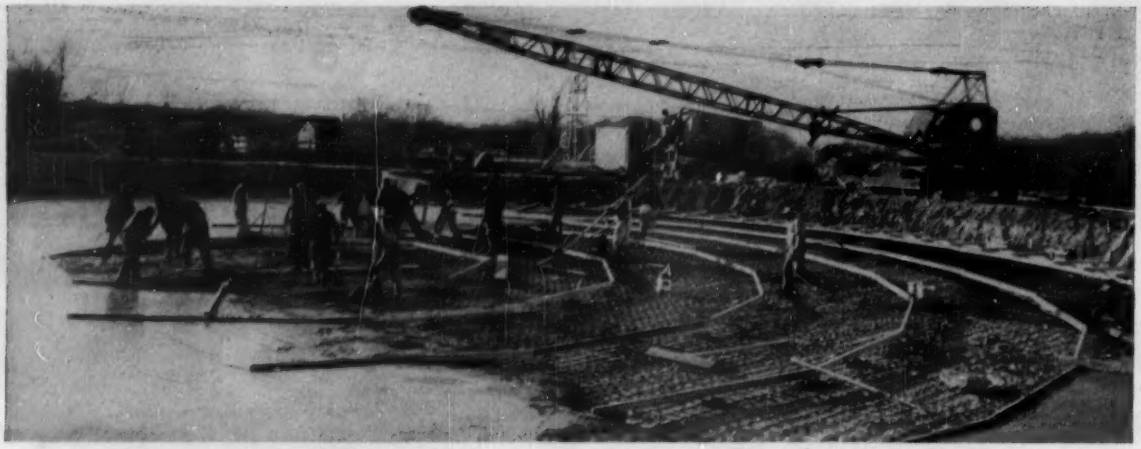
As soon as floor concrete had achieved sufficient strength, wood falsework was erected on it designed both to brace wall forms and support forms for the dome. Falsework was erected efficiently with the aid of a mobile wooden tower that was rolled around the circular construction as it progressed. A gas engine-powered hoist on its lower platform lifted materials to working levels. The rolling tower could be pushed easily over the concrete floor.

Economy Form steel pans, 30 in. square, were used for the walls. To avoid horizontal construction joints, walls were built to full height in segments of about 1/9th of the wall circumference. Temporary bulkheads were placed at

WALL FOUNDATION MAKE-READY includes a 20-in. perimeter excavation 13 ft wide and reinforcing rod. Special forms will create keyway with water stop to receive tank wall.

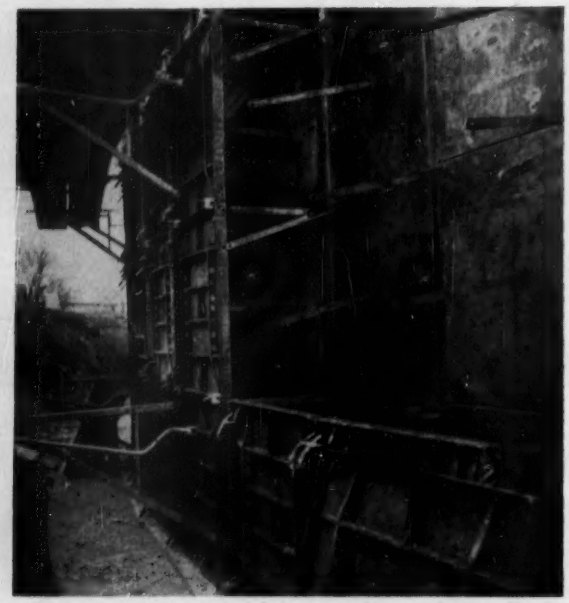
Photos by Larry Williams

CONCRETE FINISHING along perimeter foundation forms. Continuous keyway near outer edge is 21 in. wide, 2½ in. deep. Mix is chuted directly from transit-mix trucks on bank above.

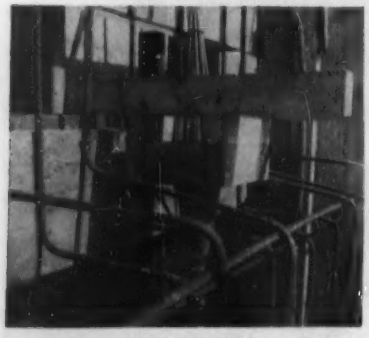


ALL BASE CONCRETE was poured non-stop to avoid construction joints. Link-Belt Speeder truck-crane swings concrete bucket loaded by truck outside excavation. Floor slab is 8 in. deep. Foundation and floor of each 125-ft tank required 540 yd of concrete.

ERECTING FORM PANELS for inside wall surface, carpenters use 2x6-in. uprights steadied by interior falsework to hold the steel pans plumb vertically. Forms were erected full height.



FORM TIES extend from completed inner forms to hold outer pans, all Economy Form products. Each wall section was poured full height without stopping, to eliminate horizontal joints.



VERTICAL PRESTRESSING WIRES in flexible steel tube are held at top by special form detail. Steel bars tie wall and dome together.

the ends of sections to permit individual pouring.

Inner forms were placed first—erected full height so that vertical prestressing and tie-in dowels for the dome could be installed before placing the outer forms. Inner forms were plumbed vertically with 2x6 lumber braced by the falsework. Outer form pans were assembled and held in alignment by wall ties from the inner pans.

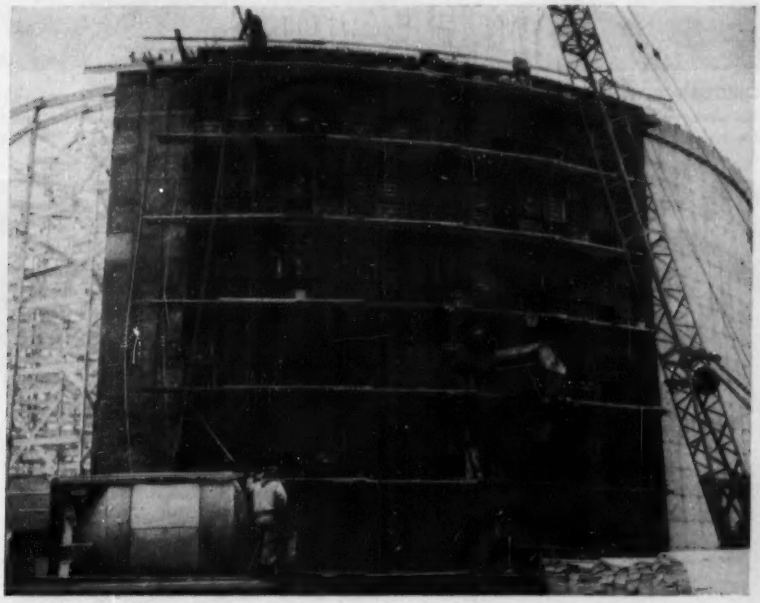
Vertical prestressing wire assemblies were fabricated on site. Units were formed by cutting 0.196-in. wire into lengths equal to twice the height of the wall. Each vertical unit was assembled by doubling back the ends of six of these wires and encasing them in a flexible metal tube to make prestressing possible after walls had been poured.

The tube with the wires was hung vertically on the inner wall form with the loops at the bottom —making a total of 12 wires extending out the top for eventual stressing. The loops at the bottom of the form were spread to provide maximum contact with the concrete. Each tank wall contains 100 vertical prestressing units.

The only other reinforcement

VERTICAL PRESTRESSING with Preload jack tensions six wires at once. Loops in wires are secure in concrete at bottom of wall.

WEDGE-SHAPED ANCHORS are slipped around stressed wires and tapped into holes in steel bearing plate set into top of wall.



WALL IS POURED to full height in convenient sections. Steel form pans left out at intervals leave windows for crane-swung bucket to place the concrete. Wall is 17 in. thick, but has a thicker "dome ring" around the top to take the added load of the roof.

ALL WIRES CUT OFF above anchors and ready for grouting—done by filling flexible tube around wires through pipe at side.

in the walls is mild steel bars shaped on site and hoisted to the top of the forms where they become dowels tying walls and domes together.

Concrete was chuted into wall forms with a crane-handled bucket through convenient "windows" created simply by omitting form panels at suitable spots until concrete rose to the level of the openings. Each tank wall consumed 1,200 yd of concrete. The mix:

705 lb cement
1,200 lb sand
1,830 lb limestone, 1 in. max.
39.4 gal water

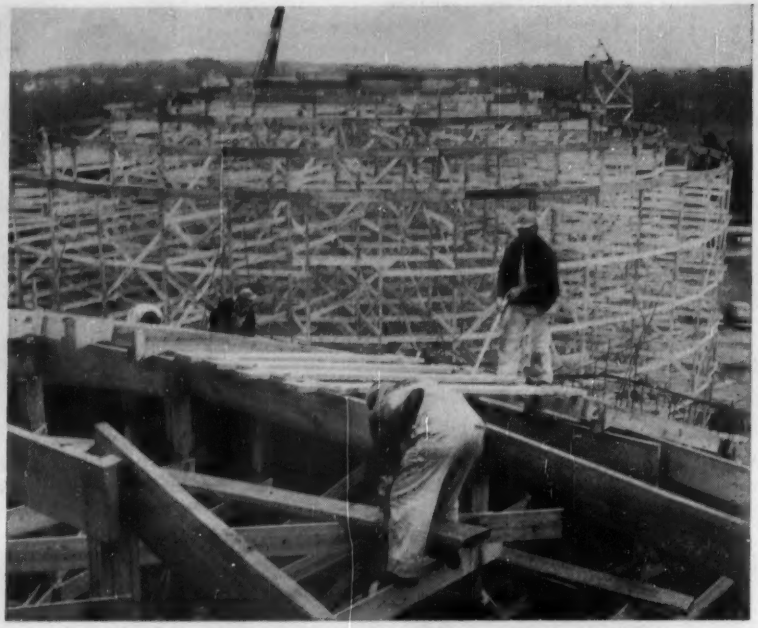
This produced concrete with 5½-in. slump and average strength of 5,400 psi in 28 days. No admixture was used.

Stressing of the vertical wire units was done with a hand-operated hydraulic jack modified to meet Preload needs. It has an adaptor head which receives six of the wire ends at one time and stresses them to 170,000 psi, to leave a working stress of 140,000 psi after losses due to shrinkage and plastic flow. Stressed wires are held in tension by split wedge anchors fitting into a steel bearing plate set into the top of the wall.

Wires then are cut off above the wedges and the open areas around the prestressing wires filled with grout pumped into the surrounding flexible metal tube through a connecting pipe set into the forms before concrete was poured. Stressing of the 100 units in each tank required approximately 113 man-hours.

Falsework for the dome had stringers spanning between posts set in circular patterns on the tank floor. Over the stringers were placed 2x8-in. ribs precut to the curvature of the dome, plus an allowance for deflection under con-

LAMINATED LEDGER is bolted near top of wall to support ends of ribs holding dome form sheathing. Wall bolting eliminates posts.



CIRCUMFERENTIAL STRINGERS secured to posts rising from the concrete floor receive the precut ribs to support dome forms. Massive falsework in background will support forms for adjacent tank. See also page 39 for a description of how falsework is erected.

DOME RIB TEMPLET assures that all 2x8-in. ribs will be cut to correct curvature for dome shell and to allow for deflection.

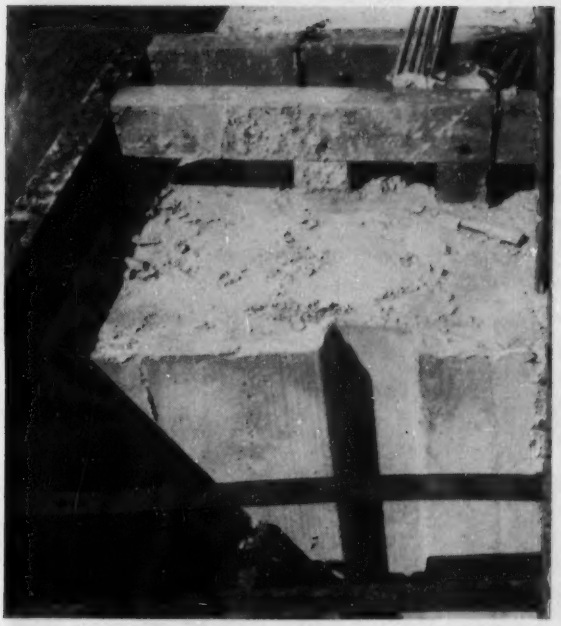
PNEUMATIC MORTAR is shot from Cement Gun machines on ground below to build up dome shell to 2½ in. thick. Wire mesh laid over form boards is adjusted to lie in center of completed shell. Bars at edge tie dome and wall together; depth here goes to 10 in.

struction loads. Square-edged wood sheathing covered the ribs and 4x6-in. wire mesh—lapped one square and tied securely—was laid over the sheathing. The major portion of the lumber in the falsework and dome forms was recovered for subsequent use.

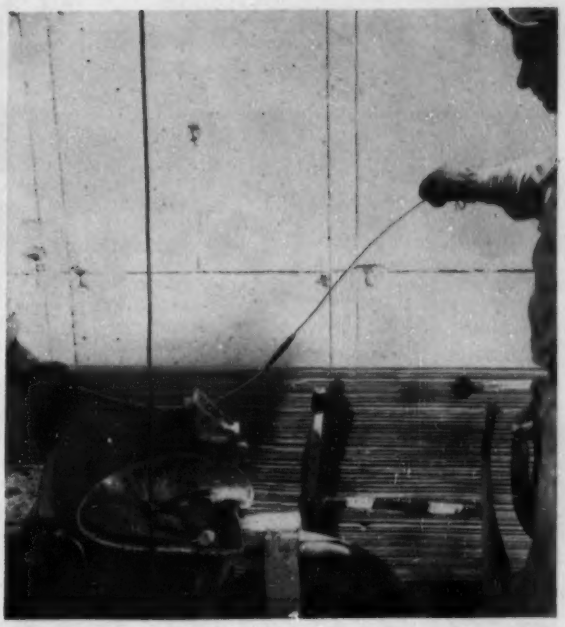
Domes were built with pneumatically placed mortar supplied by two modified Cement Gun Co. Gunite machines. During the shooting of the domes, the mesh reinforcement was adjusted to lie in the center of the completed dome shell. Shells are 2½ in. thick, except at the outer edges where the domes are built up to approximately 10 in. Each dome required approximately 120 cu yd of pneumatic mortar, placed in seven days by two operators and their assistants.

Horizontal prestressing of tank walls was done with a Preload machine after the concrete in the dome had cured. The prestressing wire used is 8-gage, 0.162 in. in dia, applied at a minimum stress of 140,000 psi which provides a final working stress of 105,000 psi. The Preload prestressing machine gives the specified stress to the wire by passing it through a die slightly smaller than the diameter of the wire.

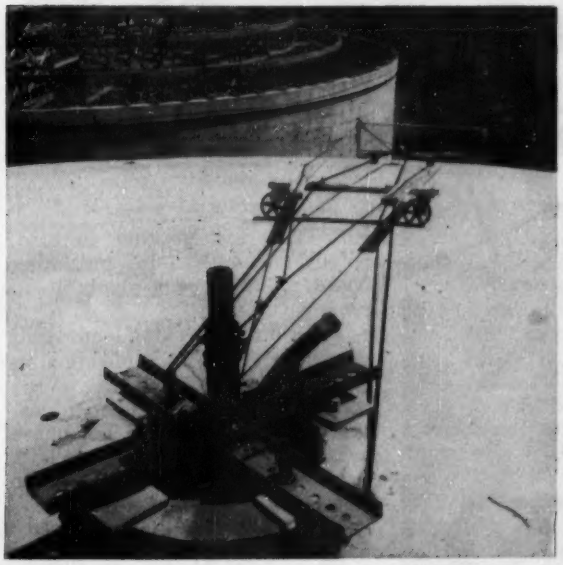
The machine travels around the tank walls at speeds up to 8 mph and applies up to 10,000 lb (some 35 mi)



VERTICAL CONSTRUCTION JOINT in wall before adjoining segment is poured. No water stop is necessary here. Note vertical prestressing wires rising out of wall in background.



SMOOTH SPLICE joins new roll of prestressing wire for wall circumference to end of preceding roll. Round die at left will be inserted in steel post to apply proper stress.

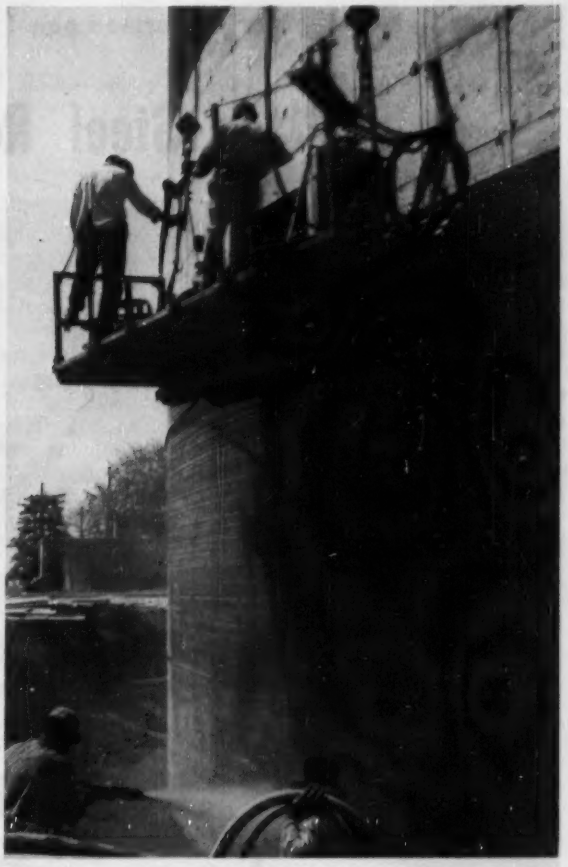


CENTER POST on dome is pivot for wire-winding machine swung over side of tank. Dolly under supporting wires keeps cables off dome surface. Safety cable circles center concrete curb.

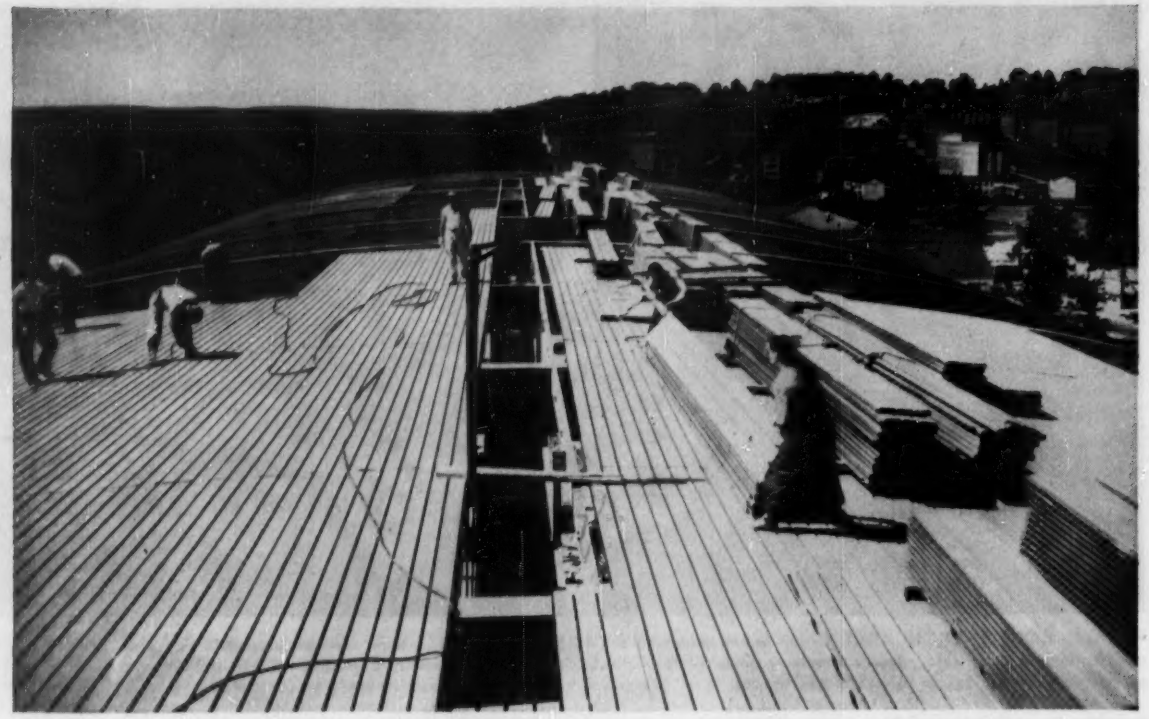
of wire per day. During the winding of the top portion of the tank walls (the dome ring), the dome shell actually rises as it is subjected to radial and circumferential compression.

Preload winds no more than 40 wires per vertical foot around a prestressed tank. The bottom of a tank will have several layers of wire, depending upon the loads expected. Each inner layer receives a grout coat at least ¼ in. thick. The outside layer will be at least ⅝ in. thick.

Construction of the two North Wayne tanks was accomplished in 25 weeks.



CIRCUMFERENTIAL PRESTRESSING MACHINE pulls itself around tank wall on special chain, placing a maximum 40 turns of wire to a vertical foot. Grout is shot immediately after to protect wire and bond it to concrete. Lower wall gets several courses.



Erectors pick up another preformed panel for welders who . . .

Place Steel Roof Deck Fast

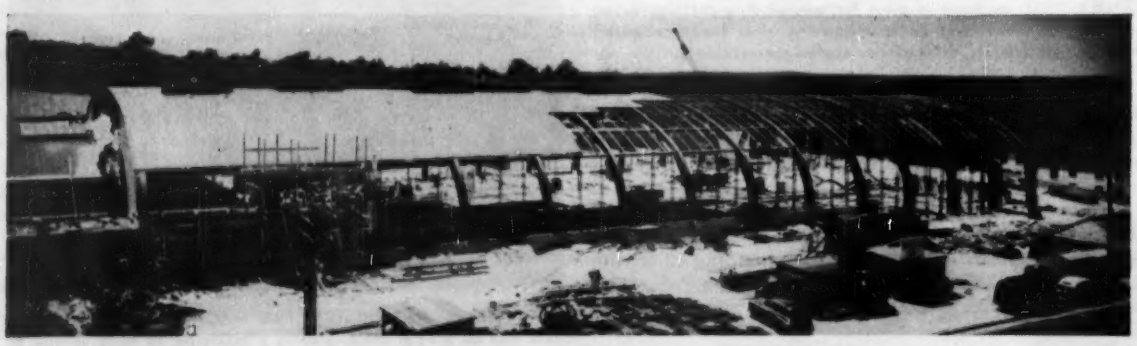
RIGID STEEL FRAME construction was chosen for economy in materials and erection time on the new fieldhouse under construction for the University of Connecticut, at Storrs.

The building is semi-elliptical in section, 343 ft long, 150 ft wide and 40 ft high—will accommodate basketball and squash courts, sports equipment and lecture rooms and have seating for 5,000 persons.

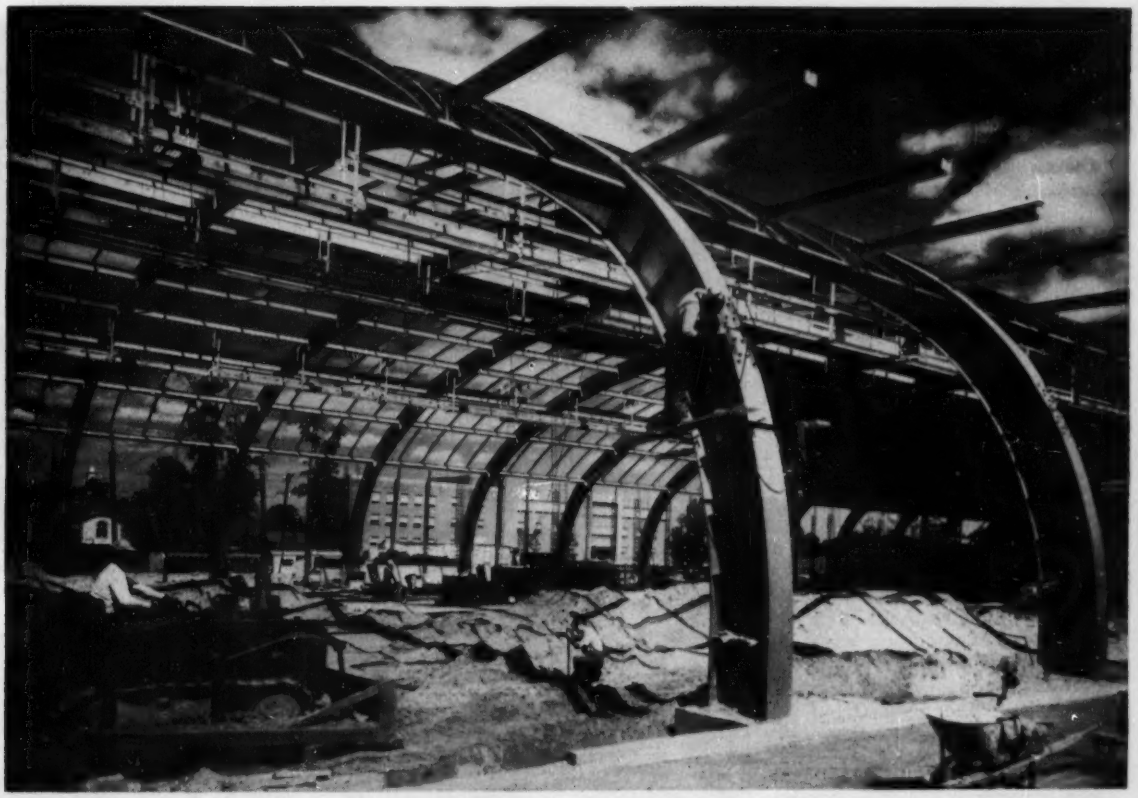
Fourteen semi-elliptical rigid steel frames, anchored in concrete footings and spanning 150 ft, make up the main structure. Walls are concrete, faced with brick, with polished granite around main entrances. Interior side-wall faces are of concrete block, and gable ends will be an expanse of glass.

The roof framing incorporates steel purlins and is covered with Wheeling Tri-Rib roof decking which features interlocking edge ribs and intermediate stiffening ribs. The steel decking, in turn, is covered with 1-in. insulating board followed by 4-ply built-up roofing.

Tri-Rib steel decking lends itself particularly well to application on curved surfaces. And ease of installation is a major factor in cost saving on the fieldhouse job, where some 42,000 sq ft of deck was laid. In addition, gross weight of the steel deck sheets and steel purlins is estimated by the contractor, City



SEMI-ELLIPTIC FIELDHOUSE to seat 5,000 is decked rapidly with standard Tri-Rib panels welded to steel purlins. Walls will be concrete, faced on the outside with brick and inside with concrete block. Gable ends will be a large expanse of glass.



RIGID STEEL FRAMES, 14 in all, set in concrete footers span 150 ft and become main support of the building. All-steel frame and roof members employ both bolted and welded joints. Centrally placed arc-welding machines serve entire project easily.

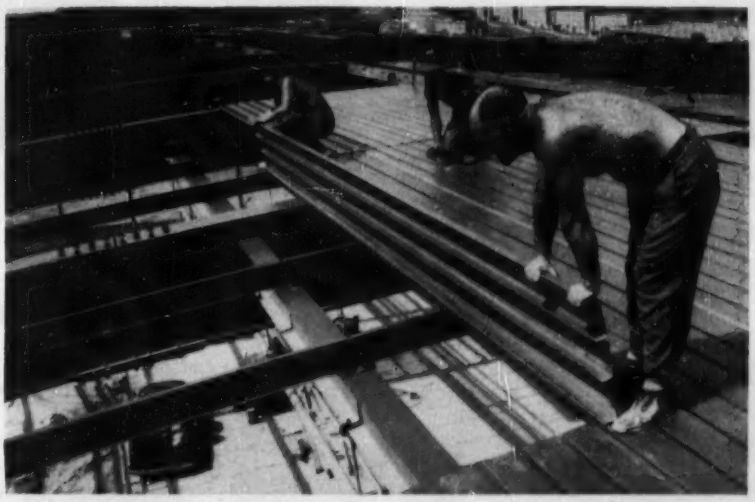
Iron Works, Inc., Hartford, to be only about 40% of wood sheathing —cutting down on the amount and cost of joists.

Deck panels are hoisted to the roof in convenient bundles with a crane and are light enough for one man to handle them when necessary. Typical panels measure 20 ft by 1½ ft, weigh 60 lb.

Quick and Easy

Installation is done swiftly. A crew of four men (two welders, two erectors) can lay up to 4,000 sq ft in a day. A finish coat of aluminum paint is applied to the underside of each panel, either before or after installation, to serve as the interior ceiling color. Welders secure the panels to the purlins and spot-weld individual sheets, as necessary.

Standard Tri-Rib panels were employed by City Iron Works practically throughout the Connecticut University job. Where roof curvature is a factor, panels can be delivered to the site shaped to the required radius, ready to install. Once laid, the steel decking immediately becomes a handy work platform for men, equipment and materials.



INTERLOCKING PANELS drop easily into place as two men place a standard 20-ft section, 18 in. wide. Welder in background welds each panel to purlins and adjacent members.

Harry Gemple is project manager for City Iron Works, who also fabricated and erected the structural steel. General contractor is Associated Construction Co., Hartford; project engineer, Robert W. Loomis. The $930,000 fieldhouse was designed by Frederick C. Teich, Hartford.

Homemade Hopper and Rollers

LAYING 3-IN. ASPHALT PAVING with an arrangement of a homemade bottomless spreading hopper and rollers, plus the help of two Caterpillar tractors and a 1½-ton Chevrolet truck, enabled paving contractor Schroeder & Co. to pave 2 to 1 slopes on the Green Verdugo Reservoir near Los Angeles at the rate of 400 to 500 tons per day.

The reservoir, capacity 32,500,000 gal, was excavated in a small canyon for the Los Angeles Department of Water and Power. Material excavated was a coarse marine conglomerate of both basaltic and granite and this material was used for an earthfill dam at the lower end of the reservoir.

The bottomless spreading hopper, designed and built in the shops of Schroeder & Co., was made of 3/16-in. mild steel and angle iron. Runners were made of 7-in. channel iron capped with 5/16-in. AR plate. It is 6 ft wide and has a capacity of 17 tons. A screed at the rear of the hopper permits laying of asphalt in thicknesses from 1 to 5½ in.

THIS CONVEYOR attached to rear of Caterpillar R-5 tractor has funneling hopper to receive loads from dump trucks. A 9-ton load can be emptied in 3½ to 4 min.

24-IN. NEOPRENE BELT CONVEYOR delivered the load to the bottomless hopper. The conveyor is removable and is powered with a Wisconsin Model AHH motor.

Eliminates Paving Marks

Big advantage of the bottomless hopper with following screed is that it virtually eliminates pie-shaped marks in pavement due to the difference between top and bottom circumferences of the reservoir. The runners can move over previously laid pavement at the top, but the marks are erased by the screed.

The bottomless hopper is filled with the aid of a 24-in. Neoprene belt conveyor attached to the rear of a Caterpillar R-5 tractor equipped with sideboom. The belt and a small hopper to receive loads from dump trucks is set in a 5-in. channel frame. It is removable. The conveyor is powered with a Wisconsin Model AHH engine and is attached to Cat by mating steel plates bolted together. This arrangement permits a 9-ton load to be emptied in 3½ to 4 min.

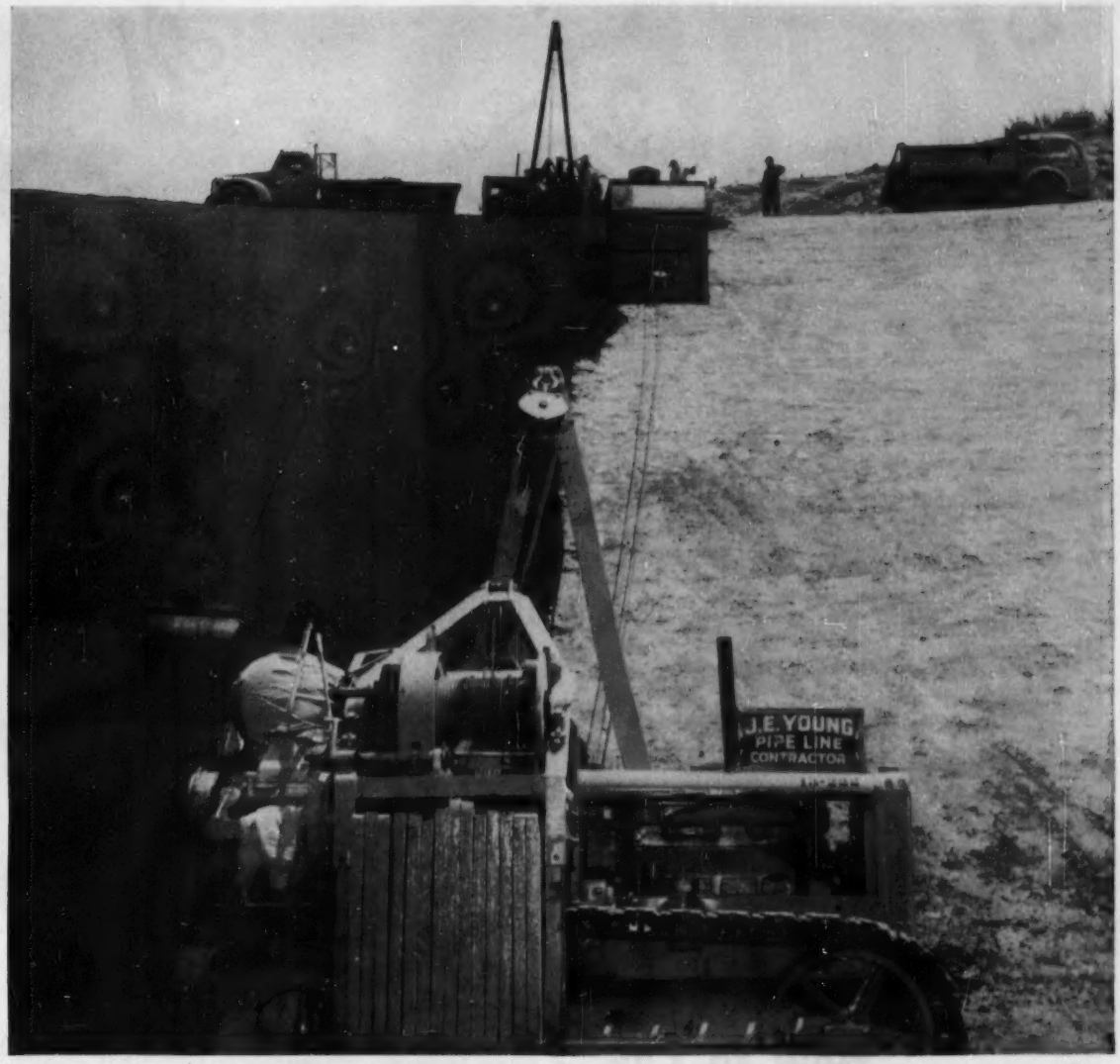
Hopper travel up and down the slope is controlled by the Caterpillar R-5 at the top and another Caterpillar D-4, also equipped with a sideboom, at the bottom. When the hopper reaches the bottom of the slope, the boom on the D-4 lifts the hopper over to the next position. The boom is equipped with 3-ft long shoes which fit the runners of the hopper. Lifting is accomplished with a chain attached to the boom and the side of the hopper.

With the hopper in the new position at the bottom of the slope, the tractor on the top then pulls it up for the start of a cycle.

Compacting of the asphalt was done by a 500-lb hot roller, 24 in. dia. and 27 in. wide, and a 4,800-lb cold roller, 42 in. dia and 48 in. wide. The smaller roller was lowered and raised by a 3-ton winch attached to a 1½-ton Chevrolet stake truck, while the larger roller was worked from the D-4 tractor. Both rollers were built by Schroeder.

Another unusual feature of the construction of this reservoir is the inclined inlet-outlet tower. Normally such towers are set well out into a reservoir for better circulation and to avoid turbidity. These factors are minor in a small paved reservoir, so the engineers economized by building the tower against the slope.

The inlet line is fed from the Los Angeles Owens River Aqueduct and terminates in a 36-in. circulating line laid on the floor of the reservoir. The outlet line, which is connected with a pumping plant, is served through three 24x48-in. sliding gates in the tower. Controls are accessible from the roadway at the top of the tower.



SPREADING HOPPER moves between Caterpillar R-5 tractor at rim of reservoir and Caterpillar D-4 at bottom. Hot roller at left of bottom Cat is operated from a 3-ton winch mounted on a 1½-ton Chevrolet truck. Paving was at the rate of 400 to 500 tons per day.

Speed Reservoir Paving Job

→

UNIQUE RESERVOIR contains a circulating inlet line and inclined tower against the slope. Usually the tower is farther out in the reservoir for better circulation and to avoid turbidity. On this particular job these factors were considered minor so the engineers economized by building the tower against the slope. The 2 to 1 slope on the reservoir was paved at the rate of 400 to 500 tons per day using a homemade bottomless hopper and rollers.

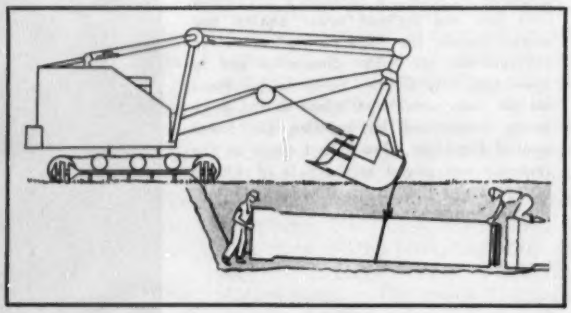
BACKHOE METHOD of concrete pipelaying generally is most efficient because the same machine doing the excavating lifts and places heavy sections of pipe. If managed properly, and terrain is not too difficult, job gets along fast with a small crew.

How to Lay Concrete Pressure Pipe

By **HARRY S. PRICE, Jr.,** Executive Vice-President, Price Brothers Co.

CONCRETE PRESSURE PIPE can be installed quickly and easily with a backhoe and a small crew. The steel-and-rubber joint makes this possible. The backhoe digs the trench, handles the pipe, places it and even makes the joint. A bulldozer for backfilling is the only other major item of equipment needed. A typical crew includes

5 SOAPED GASKET is stretched around spigot end of pipe just before its insertion into bell end of installed section.



6 WITH BOOM LOWERED, backhoe operator brings down pipe all the way, kicks dipper out to force the joint together.

1 GRADE ALIGNMENT is checked with a grade square. Short leg is held tight against bell end of installed section.

2 DOUBLE PICK-UP HOOK attached to backhoe dipper receives ends of wire-rope sling around pipe's point-of-balance.

3 GASKETS ARE GREASED with a vegetable soap thinned with water to a thick soup, should remain immersed overnight.

4 STEEL BELL RING is lubricated with same vegetable soap by brushing thoroughly after carefully cleaning out foreign matter.

anywhere from 6 to 14 men, depending on the nature of excavation and speed of laying.

Twenty to forty 16-ft lengths per day is typical, with top speed around 50 to 60 per day. On a recent installation in Michigan, average daily production was 400 ft of 48-in. pipe during a 2½ month period. One backhoe, a bulldozer and a crew of 14 were on the job.

Speed at laying in open country depends on the amount of material to be handled by the backhoe. The backhoe method is generally the most efficient under ordinary conditions for lines of 16-in. dia up to about 54 in.

This method is simple and can be learned quickly by an experienced contractor. It is adaptable to the laying of any concrete pipe with steel and rubber joints, including prestressed concrete steel- cylinder pipe and steel-cylinder pipe not prestressed. Millions of feet of these types of pipe have been installed in the U. S. during the last 15 yr for water transmission and for sewer force mains.

(More photos on next page)

7 MAN INSIDE PIPE puts stoppers into joint, holds sections slightly apart while he checks gasket with feeler gage.

8 PAPER DIAPER is placed around joint before backfilling. Then grout is poured into joint crack, flows all way around.

9 INSIDE JOINT is pointed with stiff mortar, finished perfectly smooth and cleaned several sections behind crew.

10 BACKFILLING AND TAMPING to springline is important. If trench bottom is rocky, excavation should be below grade and sand cushion laid. Grout joints should be poured after several sections have been laid, to prevent cracking.

11 PULL JACKS are used to close a joint when trench condition makes use of backhoe awkward. For larger sizes of pipe, jacks are installed internally, pull against timber blocks.

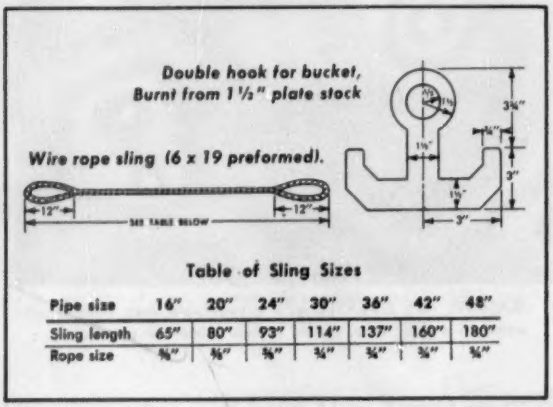
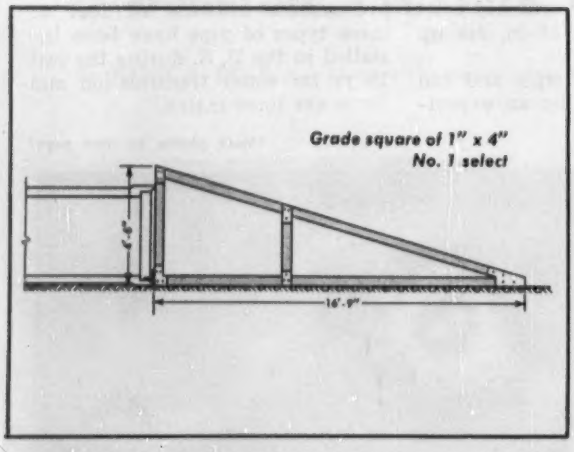


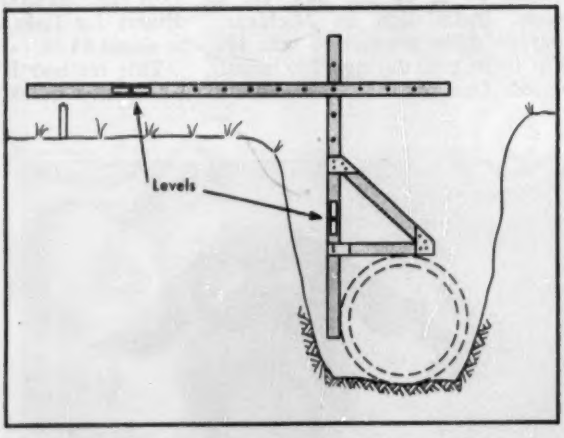
Table of Sling Sizes

Pipe size	16"	20"	24"	30"	36"	42"	48"
Sling length	65"	80"	93"	114"	137"	160"	180"
Rope size	⅝"	⅝"	⅝"	¾"	¾"	¾"	¾"

12 HANDY LIFTING HOOK for the backhoe can be made in the shop. Slings are readily available. Pipe sections can be marked for balancing points after first one is located.



13 MAKE YOUR OWN GRADE SQUARE out of select 1x4-in. lumber. Raising or lowering long leg will change grade. Short leg indicates amount of joint opening.

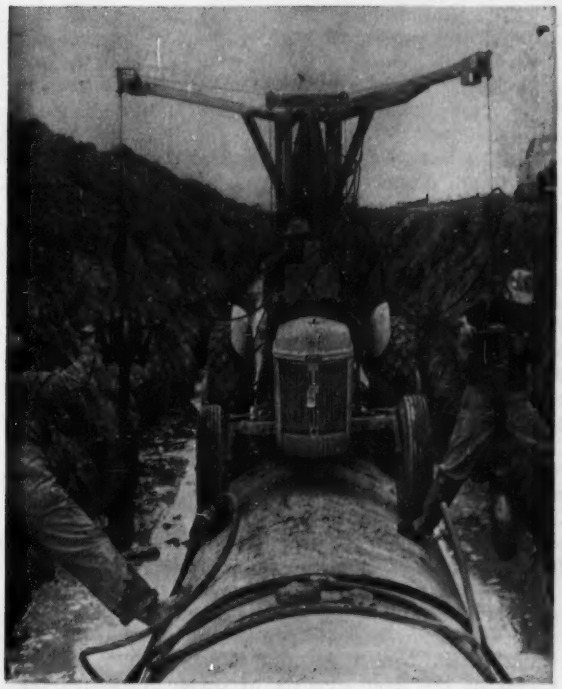


14 ALIGNMENT SQUARE is used to check grade of pipe sections as they are joined in trench. Levels indicate proper placing, and the pipe joints are "cracked" to suit.

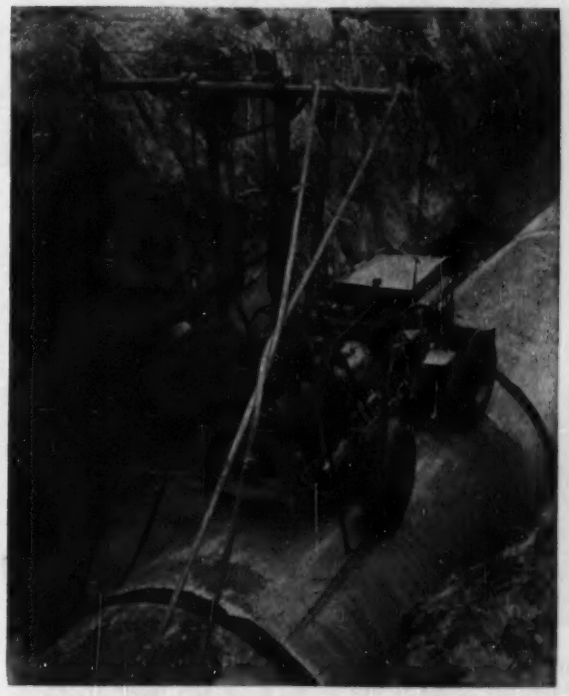
Backfilling by Saturation and Vibration

• Backfilling by the "saturation and vibration method" is a new Bureau of Reclamation specification on the San Diego Aqueduct, and the three contractors on the project each came up with his own method of meeting the requirement. In all operations rubber-tired units traveled on top of the concrete pipe, but each contractor used a different type of internal vibrator and had a different way of adding the water needed to make the backfill fluid enough to vibrate. The three methods seemed to get the necessary results.

ELECTRIC VIBRATORS with water jets attached are mounted on a Ford tractor by Johnson-Western Constructors to consolidate backfill. Power for the Model 21 Viber vibrators comes from a Kohler motor-generator set mounted on the back of the tractor. Boom on tractor lowers vibrators simultaneously in ditch.—CM&E photo



LARGER ELECTRIC VIBRATORS, also mounted on a Ford tractor, consolidate backfill for Engineering Constructors. Model 5190 Chicago Pneumatic units are cable-suspended from boom on tractor. Water jets are completely separate.—USBR photo



PNEUMATIC VIBRATORS are mounted on a Jeep by Peerless Pipe Corp. for backfill work. The Model 518 Chicago Pneumatic units are operated by Jeep driver without jetting. Water is added ahead of vibration. Air compressor is outside of ditch.—USBR photo

IT TOOK THIS Lorain 45-ton truck crane, equipped with 138-ft boom, just 22 min to pick up this transmission tower, intact with conductors in sheaves, and walk it 40 ft to a new location—typical of the wide variety of heavy-duty lifting jobs a pair of these 45-ton units are constantly doing as they travel over entire operating area of Los Angeles Department of Water and Power.

Romping Over 90,000 Sq Mi of City Streets, Desert and Mountains on Utility Construction and Maintenance . . .

Truck Cranes Make Big Lifts Routine

By CLAYTON M. ALLEN

Engineer in Charge, General Plant Division
Los Angeles Department of Water and Power

TRADITIONALLY the Department of Water and Power of the City of Los Angeles does most of its construction and all maintenance with its own forces and equipment. For the Power System alone there is now a fleet of 1,500 cars and trucks and more than 500 pieces of construction equipment operating over desert and mountain areas 300 mi to the Owens Lake region to the north, and 300 mi to Hoover Dam to the East.

Only a short time ago, it seems, mules hauled steel penstock sections into isolated power projects, and generator rotors—timber lagged—were rolled in over mountain trails. Over the years, as generators, transformers and auxiliary equipment became increasingly heavier, larger and higher-capacity lifting and transportation equipment was developed and adopted. Because of this widespread geographical range of the city's power projects, mobility of equipment and services became paramount to meet requirements in the shortest possible time with utmost safety, efficiency and economy.

With speed and mobility in mind, in 1939 the Department pioneered in the use of long-boom truck cranes for faster and safer construction. The towers for the third circuit of the Boulder transmission lines from Hoover Power Plant were erected in record time over flat country by truck cranes, and this practice is now standard in transmission-line construction. With more and more demand for larger lifting capacity and longer-boom mobile cranes, the Power System fleet has steadily expanded its services to construction and repair work throughout the System, both in yard and field.

The latest, and by far the most valuable addition to our construction equipment fleet, has been the recent purchase of two 45-ton mobile, rubber tired Lorain MC824 Moto-Cranes, diesel-engine powered, with various boom lengths available from 35 to 158 ft, including a 25-ft jib.

An unceasing search for new and modern transportation equipment led to the Power System acquiring a fleet of low-bed, rubber-tired trailers and semi-trailers with capacities from 20 to 110 tons. The largest of the fleet consists of three units—tractor, jeep (secondary goose-neck), and trailer (Fruehauf-built)—that is rated at 110 tons capacity with the jeep, and 60 tons without the jeep. This unit is con-

(Continued on page 66)

Why Sellin Bros. are sold on **CAT*** performance

Harold and Roy Sellin, Hawley, Minn., are strong for the D8 Tractor and No. 80 Scraper. They say: "For success in earthmoving, buy Caterpillar!"

Building a mile of farm-to-market road near Hitterdal, Minnesota, Sellin Bros. made excellent time in spite of wet, boggy conditions. Their equipment on this job included four Caterpillar D8 Tractors and two No. 80 Scrapers.

The big units averaged 6 round trips per hour, carrying loads up to 22 cubic yards of heavy material, over a haul distance of 500 feet. Together the scrapers moved about 3,000 cubic yards in a 12-hour day. The earth handled was black loam and heavy, wet clay, and part of the haul was through standing water.

Here's what Harold and Roy Sellin say about their machines: "Caterpillar equipment is the best made, and durability is the outstanding feature. The No. 80 Scrapers load much faster and easier than other makes of machines, and production is higher."

When you're buying a scraper, look at your *last* cost *first*. Compare the Cat No. 80 or the new No. 90 with any other make on cost per yard. Then figure the cost of repairs and down time. You'll find Caterpillar Scrapers not only *outperform* but *outlast* other makes, in every kind of going.

Your Caterpillar Dealer will give you a demonstration right on your own job—*prove* that the big yellow rigs will produce more, in less time, at lower cost. Call him today!

Caterpillar Tractor Co., Peoria, Ill.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

FOR THE "RIGHT" ANGLES USE WILD HEERBRUGG

OPTICAL SQUARES THE "WATCH POCKET" TRANSITS

WILD Optical Squares, tiny surveying instruments containing pentagonal prisms, will do the complete job of laying out and checking buildings, concrete forms, ditches, pole lines, boundaries, etc., as well as cross sections and topo maps.

These handy tools actually fit your watch-pocket. They require no field adjustment and little or no practice for use.

Single Pentagonal Prisms $19.00
Double Pentagonal Prisms $26.25
Plumbing Rod (Optional) $26.25
(Plus Postage)

For Detailed Information Regarding the "Why and How" of Optical Squares Request Booklet CO1

Extensive repair and servicing facilities by factory trained specialists.

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OF AMERICA, INC.
MAIN & COVERT STS., PORT WASHINGTON, N. Y.
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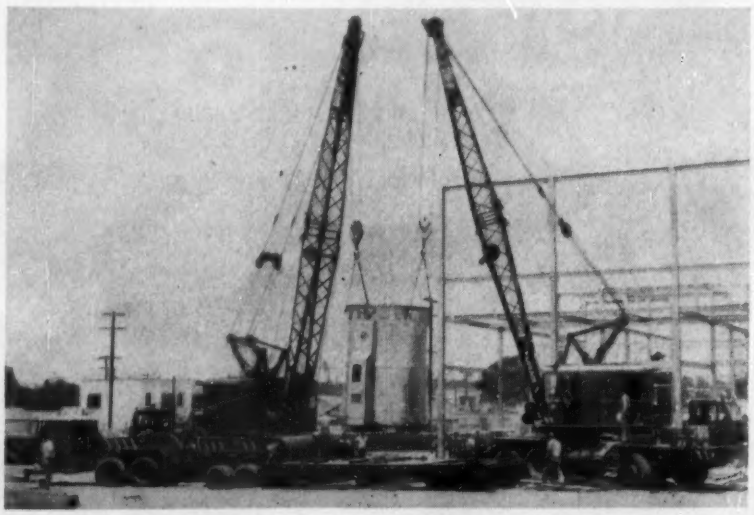
BIG LIFTS . . . Continued from page 64

sidered to be one of the largest of its kind on rubber tires.

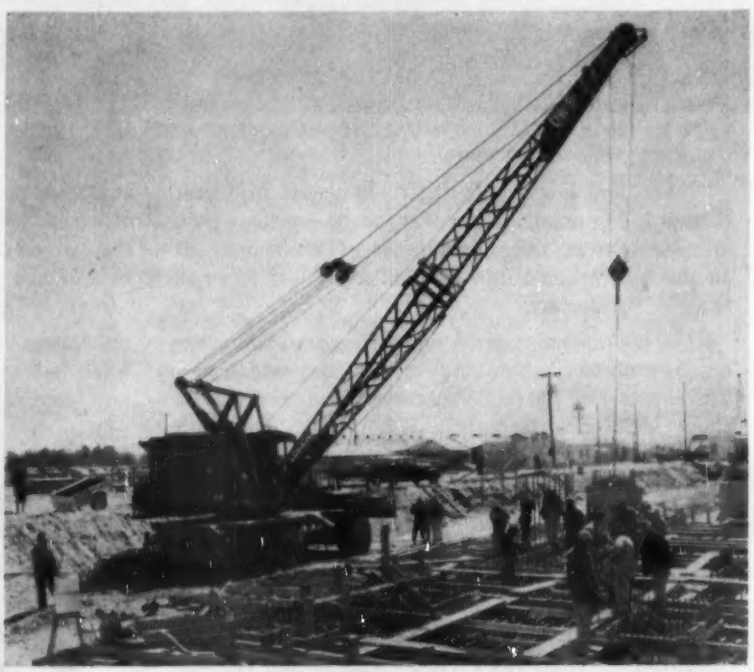
The addition of the mobile crane fleet, along with the trailer fleet, has resulted in fewer trips with larger loads handled and moved in less time with greater safety and at lower over-all costs.

Still more significant is the saving in time and money accomplished by the use of large mobile cranes operated singly and in teams to move and install condensers, transformers, and other heavy lifts of 80 tons and over. Four mobile cranes installed two synchronous condensers with rotor, stator, and end bells, weighing 70, 60, and 30 tons, respectively, in the remarkably short time of one day.

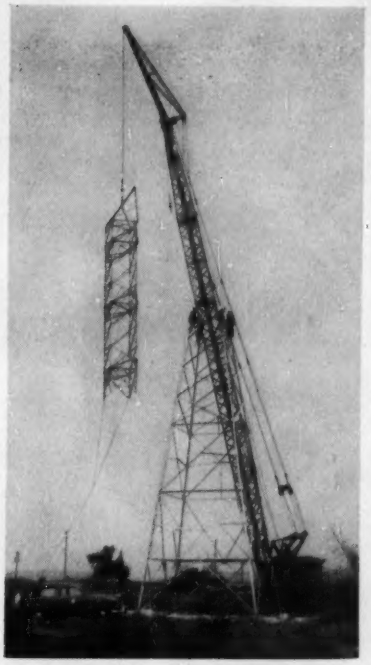
Machines were available for service six weeks earlier than they would have been under the previous more hazardous installation by heavy cribbing, jacks, rollers, and manual labor. Still more advanced



BOOMS ARE SHORTENED to 50 ft as this pair of Lorain 45-ton truck cranes jointly lift 70-ton transformer from Fruehauf low-bed trailer. Auxiliary dual-axle gooseneck, called a jeep, increases capacity of hauling trailer from 60 to 110 tons. Cranes set transformer in place with no help from additional equipment.



BIG CRANE takes forward-and-back travel in stride as it places concrete for Valley Steam Plant foundation.



ERECTING TWO TOWERS like this per day is an easy schedule for a big Lorain crane rigged with 138-ft boom. Towers are assembled on ground in sections and are erected in five lifts. Here 3-ton top section is lifted into place with crane working at 50-ft radius without outriggers, as crane must move after picking up load. Six-man crew and crane sets four times as much steel as 10-man crew formerly did without crane.

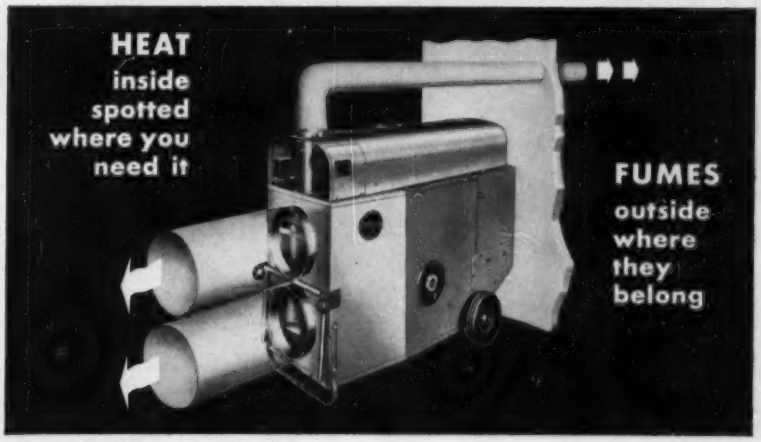
UP AND WAY OVER—12-ton transformer is hoisted to place over and beyond 20-ft barrier by big crane equipped with 70-ft boom. Outriggers steady the rig for 40-ft reach with load.

progress has been made in the setting and transporting of transformers weighing up to 86 tons by the two 45-ton cranes, and up to 132 tons by four cranes.

These impressive results in the handling of our heavy equipment, including reduced installation and assembly costs, give promise of considerably more savings in future plant designs, such as the possible elimination of gantry cranes, railroad spurs, and spare eqiupment. The only slightly increased offsetting costs are heavy ballasted roads and approaches to equipment foundations, larger driveways and entrance gates.

Dispatched out of a central headquarters on the edge of the central business district of Los Angeles, the big Lorains travel and work throughout the operating area, equipped as necessary for the job to be done, staying out for periods of time from a fraction of a day to several months. During the first year of operation, one of these cranes traveled 1,100 mi over city streets, desert and mountain.

SAFE HERMAN NELSON
PORTABLE AIR HEATERS



Cold weather work slowdowns needn't bother you this winter. Put Herman Nelson Portable Air Heaters on the job—at construction sites, in warehouses, loading areas, anywhere you want temporary or emergency heat. Direct clean heated air wherever you need it through flexible canvas ducts. With Herman Nelson there's no fire danger, no carbon monoxide, no fumes, smoke or soot. All combustion products are safely vented outside. What's more, you have the added protection of lower surface temperatures and automatic safety controls. Herman Nelson has the only complete line of completely safe Portable Air Heaters. Models available from 125,000 to 450,000 BTU. Oil or gasoline fired, electric or gasoline powered.

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PORTABLE AIR HEATERS
Another Product of American Air Filter Company, Inc.
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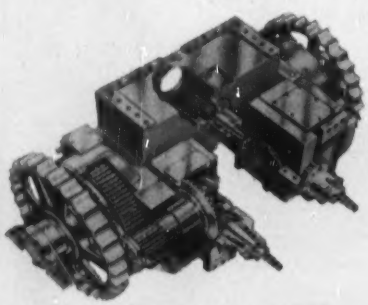
The Eimco 105 Tractor-Excavator is a heavy-duty machine, made for digging or excavating in rock and other difficult materials. For easy loading, larger buckets are available up to 2½ cubic yard capacity depending on material to be loaded.

All of the features of the Eimco 105 are covered by numerous patents issued or patents pending.

THE EIMCO 105 FINAL DRIVE

Eimco's final drive assembly is just one of the new and exclusive features of the new Eimco 105. The Eimco final drive is a rugged heavy-duty assembly made of heavy alloy steel shafts and gears and encased in heavy alloy steel cast housings. The design permits easy access to gearing through side plates. The anti-friction bearings are assembled in cages for perfect fits and longer life.

Notice the absence of troublesome clutches, brakes and gadgets in this sturdy assembly.



Eimco 105 Tractor Excavator is a new heavy-duty machine, thoroughly tested in the field, with all desirable features for a modern prime mover.

The 105 is a complete departure from ordinary tractor design in appearance and arrangement. The design features permit stronger construction, easier service when necessary and many other operating advantages such as:

1. Freedom from "leveritis" on the pulling and pushing of numerous hand levers, foot clutches, hand brake levers for steering and the necessity of stopping to change speeds or directions. With the 105 you use two small levers (one for each track) that can be held by one hand to give you forward motion — instant reverse or any degree of turn from "spin" turn to "feathered" turn. You can move the speed changing lever from one position to another while in motion under full load.

2. Full track oscillation even with attachments such as the Eimco loader.

3. Controlled loading speed through the Eimco two-speed bucket discharge mechanism. Easy light truck loading in low speed.

(Above right): Eimco 105 excavating material in pit with uneven bottom. This type of digging and loading is impossible with any other economical type equipment. (Above left): Fast moving 105 backs across to place bucket full of rock in truck which is parked on even spot in pit. (Below): The Eimco 105 can load trucks or railroad cars up to 11 ft. high. Average loading speed is 6 - 10 yards per minute in rock. Illustration on opposite page: The Eimco 105 shown here is loading a large truck from the end on a grade of approximately 20%. Two speed loading mechanism (exclusive on Eimcos) permits throwing load all the way back in this type of loading.

THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.
Export Office: Eimco Bldg., 52 South St., New York City

B-3

4. Complete visibility with the operator well up front where he can see what's going on.

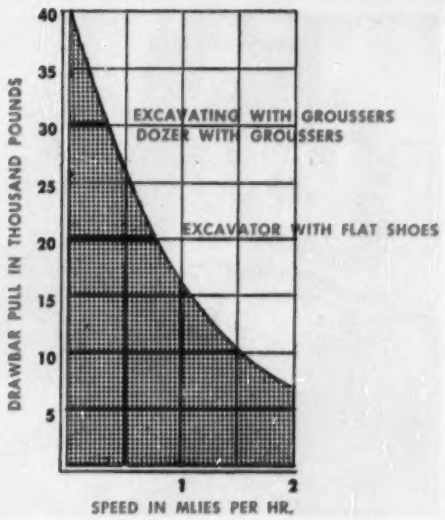
5. Greater production because of its easy handling and greater maneuverability.

6. Clutches never require adjustment.

Dependable operation is always a feature of Eimco equipment and in this the Eimco 105 is no exception. We have tried this machine under operating conditions where in a few short hours it has been subjected to more abuse than a high speed contractor can deal out in a month. The 105 can take it.

This rugged construction of the 105 was carefully planned. Every part has been designed for strength. Castings are all alloy steel. Wearing parts have been very carefully heat-treated. Machining tolerances have been held to rigid standards.

In addition to this, new designs have been incorporated in many of the individual pieces in order to give them greater strength, easier accessibility and in many cases to assure many years of operation with absolutely no attention except normal lubrication.



Drawbar pull charts based on preliminary tests showing relative comparisons.

Rebuilt Road Is High,

UP IN THE MOUNTAINS of west-central Pennsylvania, a 10 mi stretch of U. S. Route 219-322 between Grampian and Luthersburg is getting a $400,000 face lifting—widening, resurfacing and easement and super-elevation of curves. But the job isn't easy—it's too cut up and full of potential slow down factors. For example:

Sometimes the added width is all on one side of the road, sometimes it's on both sides. Width and type of widening construction vary. Stone has to be hauled 60 mi. And traffic must be maintained. In spite of all these drawbacks, Allegheny Asphalt & Paving Co. is laying as much as 1,000 tons of high-type asphaltic concrete in a 9-hr day. Here's how the Pittsburgh contractor has mechanized the job to reach that respectable production:

First operation is to excavate alongside the existing Portland cement concrete slab (18 ft maximum width) with a Buckeye Hi-Way widener. This machine takes a full-depth cut of 10 or 12½ in., depending on how the widening strip will later be completed. The self-propelled widener dumps spoil on the pavement, where it is picked up by an Athey force-feed loader that transfers it into trucks for disposal.

Width of the Buckeye machine's cut is 3 ft. Width of required widening strip is as much as 5 ft (to make the new highway a minimum 22 ft) and sometimes it shaves off to zero on transitions. Where added pavement width is greater than the length of the widener's digging wheel, a Caterpillar No. 12 grader takes out the excess; where it is less, the 3-ft wide cut is backfilled to line.

TRENCH IS EXCAVATED alongside pavement of U. S. Route 219-322 as first step in 10-mi Pennsylvania widening and resurfacing job. Buckeye machine takes 3-ft cut 12½ in. deep.

A Galion 5-ton trench roller compacts the subgrade in the widening trench. Then a 2-in. bed of stone screenings is placed with an Apsco road widener, which is followed by another that spreads a 5-in. layer of 4-in. crushed limestone. On this stone go additional Apsco-placed screenings.

Next, two Jackson compactors

BASE MATERIAL IS DISTRIBUTED in widening trench by Apsco machines. On compacted subgrade goes 2-in. bed of screenings, then layer of 4-in. stone topped with more screenings. After compaction, another layer of stone and screenings brings base to grade.

SPOIL IS PICKED UP from pavement, where widener dumped it, and is transferred to truck by Athey loader. Ribbon of spoil is left temporarily to show pavement edge to motorists.

Wide and Handsome

with 30-in. shoes walk over the surface to vibrate the three layers together, choking and keying them into a solid mass. Sprinkling and rolling turns this into a sort of waterbound macadam. Another 6-in. lift of stone plus screenings, similarly placed and treated, brings the base up to grade.

Existing Portland cement concrete pavement on some parts of the road is in pretty good shape, so here the highway is just widened, not resurfaced. On these stretches the stone base in the widening trench is held 2½ in. low and is topped with a 1½-in. binder course and a 1-in. wearing course of plant-mix bituminous concrete. More generally, base is brought up flush with existing pavement. Then the entire roadway width is given the 1½-in. plus 1-in. bituminous concrete treatment after tack-coating with asphalt (cut back with naphtha) that is air-sprayed by a 200-gal Littleford trailer-mounted machine.

Bituminous concrete for widening and resurfacing is mixed in a 120-ton per hr plant designed and built by Allegheny. The company wanted a 4,000-lb batch plant that could be moved more readily than those commercially available, so it worked up this one a few years ago from both standard and home-made components. Allegheny says it can dismantle, load, unload and re-erect it in less than 1 week. It takes 10 trailer-loads to move it.

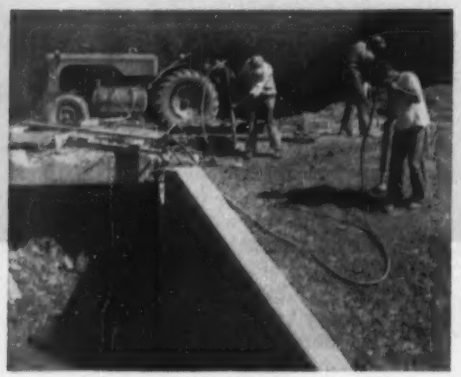
The plant is built around a 2-ton pugmill and twin 6x20-ft drum dryers, all Hetherington & Berner units. A 16-ton cold feed bin with reciprocating feeder is mounted above each of the two dryers to drop clamshell-loaded sand or stone into their respective drums by gravity. Through these cold bins pass the flues that take hot exhaust air from the dryers to the dust collectors. Thus the material is initially warmed and dried to flow more readily and steadily into the dryers.

The two drums discharge into a

(Continued on page 74)

BASE IS COMPACTED by Galion trench roller and by Jackson vibrating units (right photo). Vibration works screenings into stone layer to make tight base. This compaction treatment is given to each of two 5-in. (final depth) lifts that make up 10-in. base.

Tamping — Here's a Le Roi-CLEVELAND backfill tamper air-powered by Tractair, that gives you faster, easier tamping, better compaction, lower costs. This example shows how Tractair teams up with Le Roi-CLEVELAND Air Tools to save time, work, money.



Cutting asphalt pavement — with a Tractair-powered Le Roi-CLEVELAND paving breaker. Note, Tractair in background is equipped with a sweeping attachment. This is just another of many ways that Tractair can save you money.

Drilling trench — Easy holding Le Roi-CLEVELAND sinkers provide the fastest way of drilling rock. The air-power source is a Tractair, equipped with a front-end loader. Tractair is extremely mobile. It has a low center of gravity. It takes money-saving air power anywhere.

LE ROI TRACTAIR

...the 10 in 1 machine that does 10 basic jobs to save you money

It holds down your investment in special equipment

Because Tractair is a combination 35-hp wheel tractor and 105-cfm air compressor, it is extremely versatile.

It lets you take air power wherever you want it — air power for drilling rock, tamping fill, breaking concrete, driving spikes and form pins, or pumping water.

When it is equipped with attachments, you get added usefulness. You can load, back-fill, dig, sweep or hoist.

Although Tractair was pioneered and developed by Le Roi Company to do 10 basic jobs, its money-saving usefulness on costly, nuisance-type work is limited only by the user's imagination.

If you want to cut costs, get Tractair. Call your Le Roi dealer for a demonstration, or write us for further information.

LE ROI GIVES YOU MORE FOR YOUR MONEY

More Utility!
More Profits!

Loading — Tractair takes air power practically everywhere, yet it can be used for a wide variety of other jobs. Its front-end loading attachment, for example, has 8 accessories that interchange easily, so that Tractair can load, lift, back-fill, plow, etc.

Tractair with Mobildrill — Mobildrill is a lightweight wagon-drill attachment for Tractair. It gives you unusual mobility — one man can drill holes at any angle and any elevation up to 12 feet. Swinging boom permits drilling 4-6 holes of a pattern from one spot.

Compressors
Rock Drills
Tractair
Engines . . .

LE ROI COMPANY

Milwaukee 14, Wisconsin

A Subsidiary of Westinghouse Air Brake Co.

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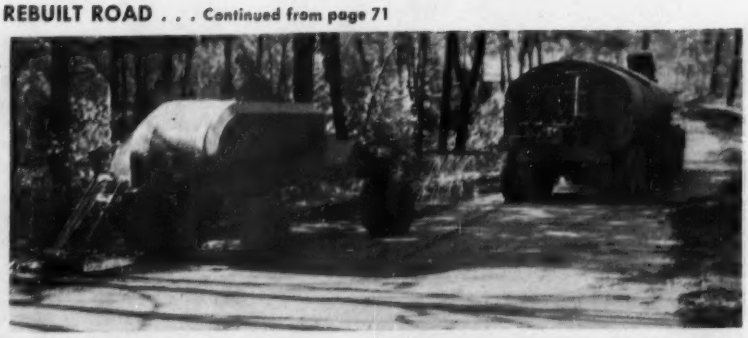


BASE IS COMPLETED by sprinkling and rolling to turn it into a waterbound macadam. Broom-equipped Galion roller follows 3,500-gal tank trailer drawn by Dodge truck-tractor.

CURVE IS SUPER-ELEVATED as part of highway modernization. Stone base is spread by converted Barber-Greene asphalt finisher and shaped to contour by Caterpillar No. 12 grader.

CURVE BASE IS COMPACTED and screenings are worked in by self-propelled Jackson multiple vibrating unit that covers 13-ft strip in one pass. Base is sprinkled and rolled, too.

single hot elevator that raises dried material to a 2½-deck sloping vibrating Diester screen. From here, sand and stone fall into three 30-ton hot bins. After being weighed on Howe equipment, they drop to the pugmill.

Allegheny's plant needs no steam, thus is independent of water supply and can dispense with a fireman. Instead, the 20,000-gal asphalt storage tank, jacketed pipelines and pugmill are heated with 400-deg oil circulated by a HyWay hot oil heater with automatic thermostat controls. Also to eliminate steam, mixer gate is air-operated, and dryer burners are fitted with

air nozzles to atomize the fuel oil. Air is supplied at 100 psi by a 500-cfm Schramm stationary compressor. Like the other components of the plant, whose total installed horsepower is 283, the compressor is electrically driven.

Accompanying tables show aggregate grading and mix proportions for both binder and wearing courses. After an initial dry mixing and a 30-sec wet mixing, the asphalt concrete is dumped into Cummins-diesel-powered International R190 trucks that haul 14-ton loads to the paving site.

On the sections to be widened only, the trucks discharge into an Apsco machine that places the mix on the stone base in the widening trench. Then a Galion roller compacts it. On the section to be resurfaced as well as widened, the trucks dump into Barber-Greene finishers.

Two of the B-G machines are operated in echelon, each paving one-half the roadway width. They are followed closely by Galion and Buffalo - Springfield three - wheel 10-ton rollers and B-S two-axle 10-ton tandems. Because the road must be kept open to traffic, the first finisher stays a couple of hundred feet ahead of the second. This lets vehicles cross over from one

TYPICAL AGGREGATE GRADING
(Percent Passing, by Weight)

Sieve Size	Binder Course	Wearing Course
1½ in.	100	
1 in.	96	
½ in.	57	100
⅜ in.		98
#4	23	51
#8	20	40
#16	17	29
#30	14	23
#50	6	11
#100	3	5
#200	1	2

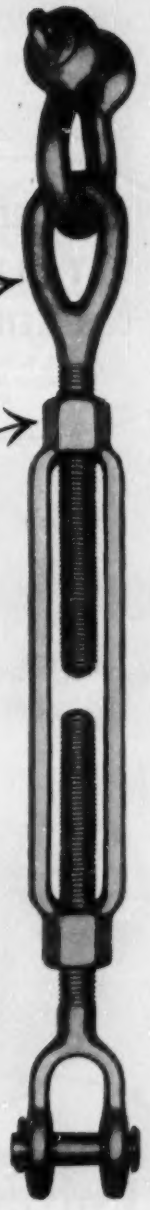
JOB MIX
(Weight in Pounds)

Material	Binder Course	Wearing Course
Stone—1½ in. minus	1300	
Stone— ½ in. minus	1720	2468
Sand—#4 minus	784	1284
Asphaltic Cement (85 - 100 penet.)	196	248
Total batch	4000	4000
% Asphalt	4.9	6.2
Temperature (°F)	270	270

IMPROVED TURNBUCKLES have

NEW EYE DESIGN

HEX ENDS



Laughlin's exclusive pear shaped turnbuckle eyes were designed to eliminate need for special shapes. It's the only eye that will take the ear of a shackle one size smaller than the turnbuckle. The shape makes it stronger than a round eye. It looks better and works better. The next time you need turnbuckles order Laughlin and see for yourself.

All Laughlin turnbuckles have hexagon ends and rugged reins. Easily adjusted with a wrench. Wheelabrated finish dipped in a rust preventive or hot dip galvanized.

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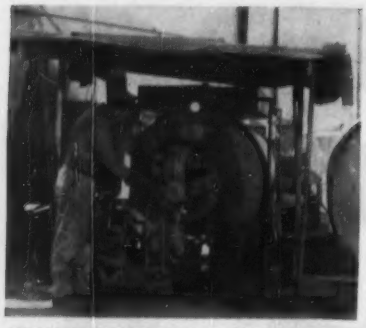
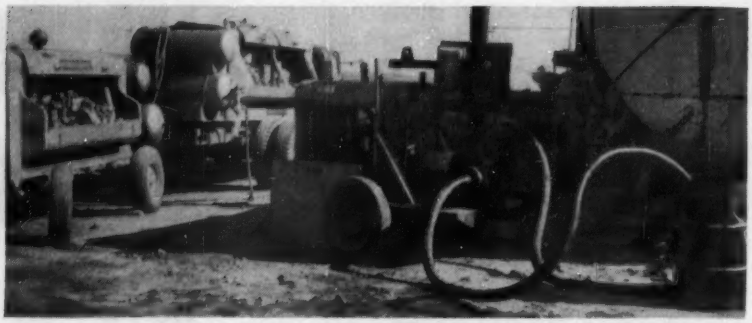


ASPHALT IS HEATED by HyWay unit that supplies hot oil to storage tank, jacketed lines and pugmill, so plant needs no steam.



ASPHALT IS TRANSFERRED from delivery truck to storage tank by this 200-gpm Chrysler-driven pump. At left are Gardner-Denver 210- and 315-cfm compressors that supply air to the plant's dryer burners while its permanent compressor is down for overhaul.

"THAT'S REALLY THE WAY TO HANDLE CONCRETE"

says L. G. (Bud) Waigand, Project Manager, Peter Kiewit Sons Co.

How would you haul and place 16,000 yards of concrete on a big water reservoir job, with pours scattered all over . . . and with a tight schedule?

Peter Kiewit picked two 3-yard Dumpcretes, mounted on light, short-wheelbase Chevrolet trucks for their U. S. Bureau of Reclamation job near Salt Lake City.

"We liked the Dumpcretes because they're fast," says Mr. Waigand, "and because they place equally well into forms, buckets or collecting hoppers. They're rugged too, and cause little downtime."

For facts on 2, 3, and 4-yard Dumpcretes write today.

Two men ran this Noble batch plant with 28S Koehring mixer

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Fastest from plant to pour

lane to the other between the two finishers, but keeps traffic off pavement not yet compacted by the rollers. Generally, both finishers place binder course one day, then switch to wearing course the next.

Widening of curves calls for a somewhat different treatment, for they are being super-elevated at the same time. A low bank of earth, dug from borrow pits by a Northwest 25 shovel, is placed around the outside of the curve

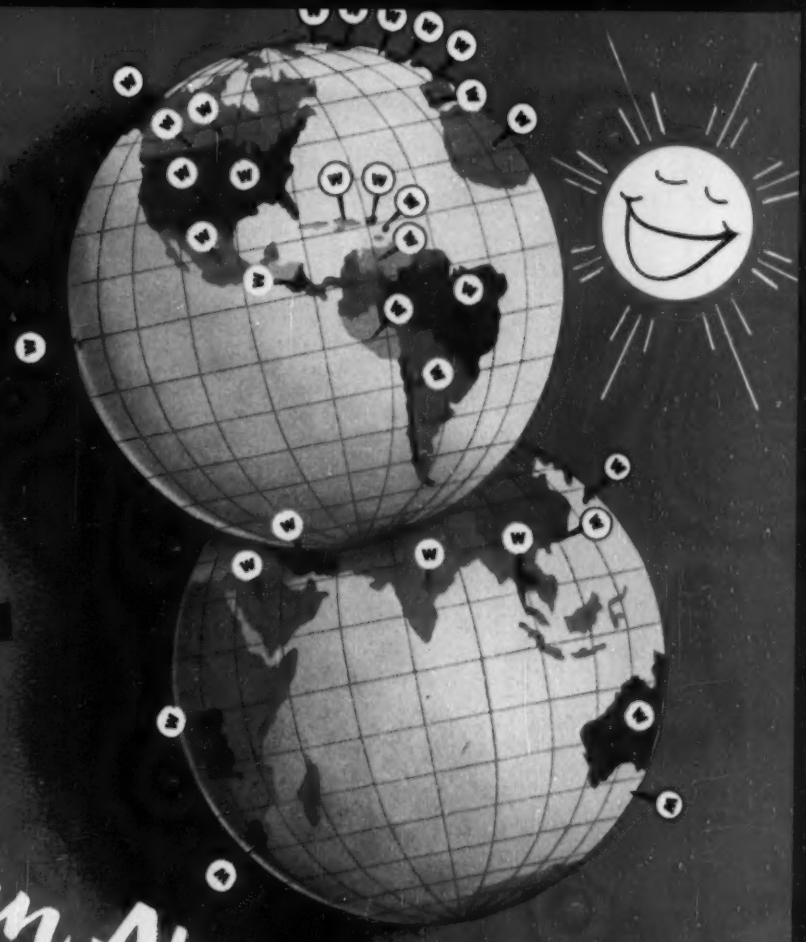
MAJOR EQUIPMENT

1 Asphalt plant, 4,000-lb batch
1 Speedcrane 2000 clamshell
1 Northwest 25 shovel
2 Gradalls
2 Caterpillar No. 12 graders
1 Galion 116 grader
3 Barber-Greene finishers
1 Jackson multiple compactor
2 Jackson hand compactors
2 Buffalo-Springfield 2-axle tandem 10-ton rollers
2 B-S 3-wheel 10-ton rollers
1 Galion 3-wheel 10-ton roller
6 Galion trench rollers
4 Apsco widening spreaders
1 Buckeye widener
1 Athey loader
1 Littleford tack-coater
2 Sprinkler trucks (1,000 and 3,500 gal)
5 International R190 dump trucks
1 Dodge dump truck

to act as a form to hold the super-elevating fill. This is 4-in. crushed stone that is spread by a Barber-Greene bituminous finisher converted to handle this type of material. A Caterpillar No. 12 grader, working with the finisher, planes the stone to the right contour.

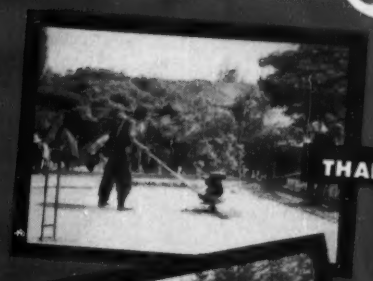
Stone is covered with screenings distributed by a Temple spreader on the rear of a dump truck. Then a Jackson multiple compactor with six 26-in. shoes vibrates the mate-

(Continued on page 79)



...the Sun Always Shines—

ON Whiteman CONCRETE EQUIPMENT



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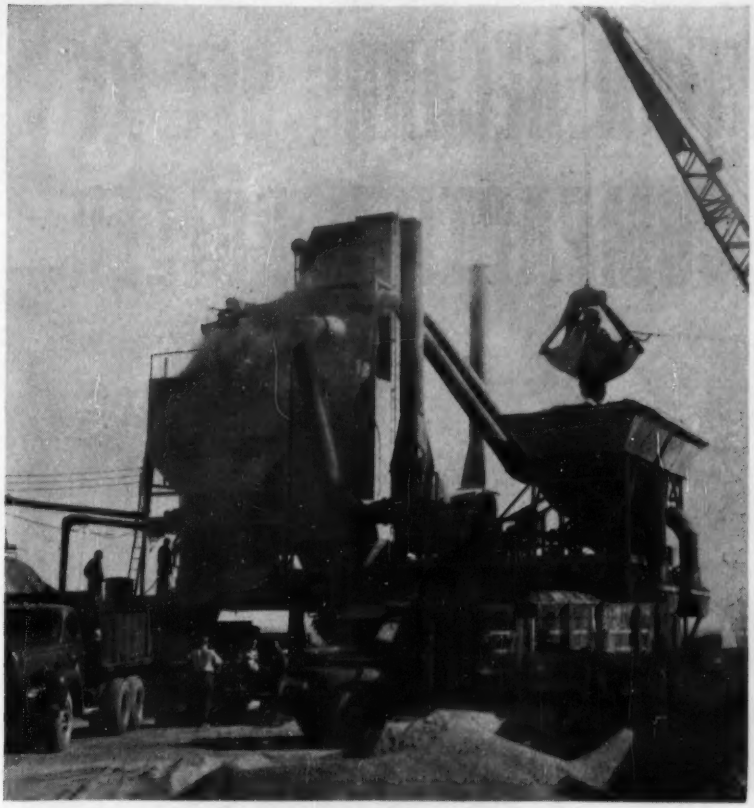
REBUILT ROAD . . . Continued from page 76

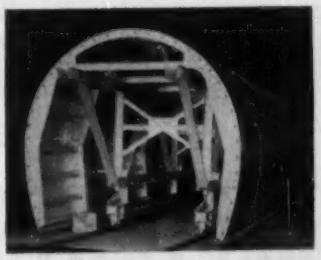


ASPHALTIC CONCRETE IS MIXED in 4,000-lb batch plant that contractor designed for easier moving. It takes less than one week to dismantle, load, unload and re-erect it.

ASPHALTIC CONCRETE IS LAID DOWN by Barber-Greene finisher fed by 14-yd International dump truck. Similar equipment paving other half of roadway has just passed over hill.

rial into a tight lift. After sprinkling and rolling, the curve is ready for the same surfacing given the tangents.

Allegheny Asphalt & Paving Co. Inc., Pittsburgh, is doing the work for the Pennsylvania Dept. of Highways. George E. Nagele is district engineer and Fred Brush is resident engineer for the state. For Allegheny, W. S. Walker is superintendent, Charles Patrick is general foreman, and Dominick Gigliotti is job engineer.



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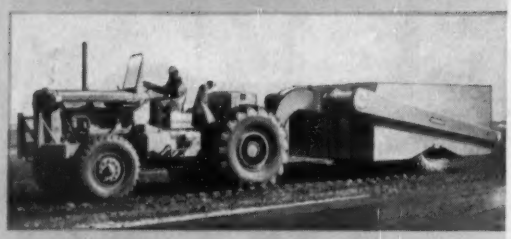
with Caterpillar Diesel Tractors



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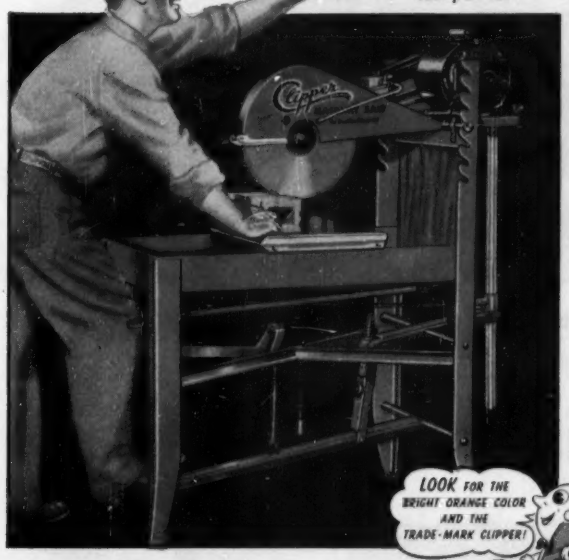

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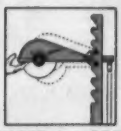

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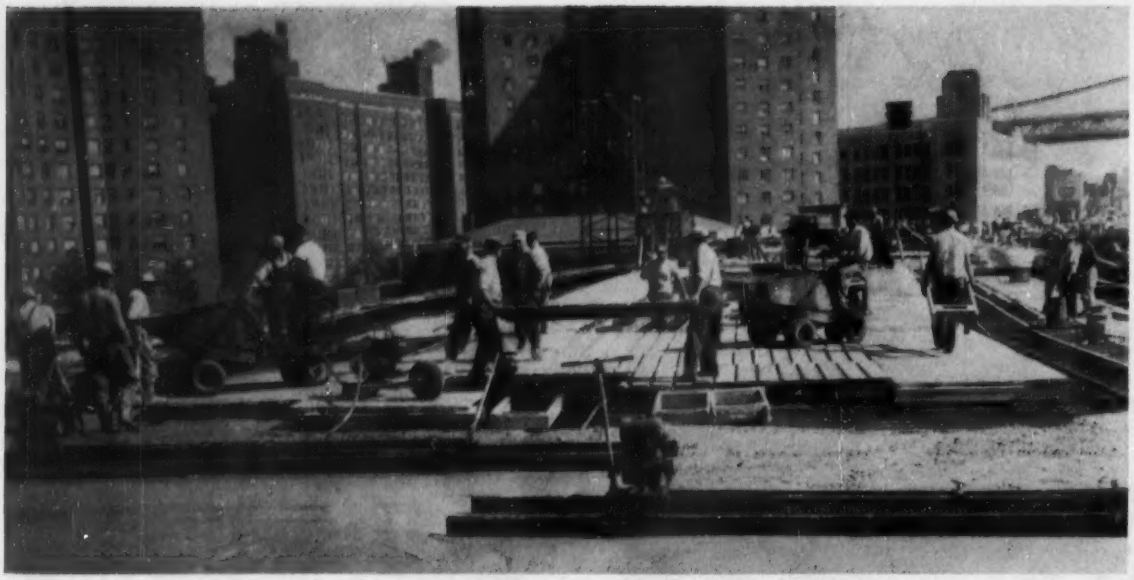
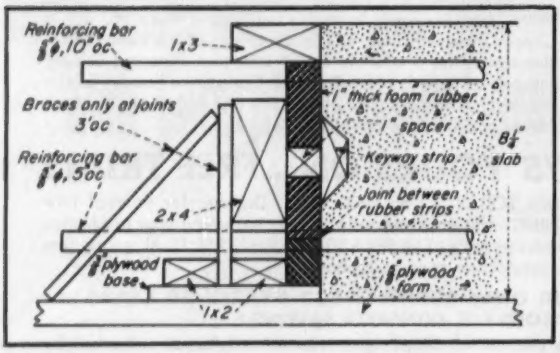
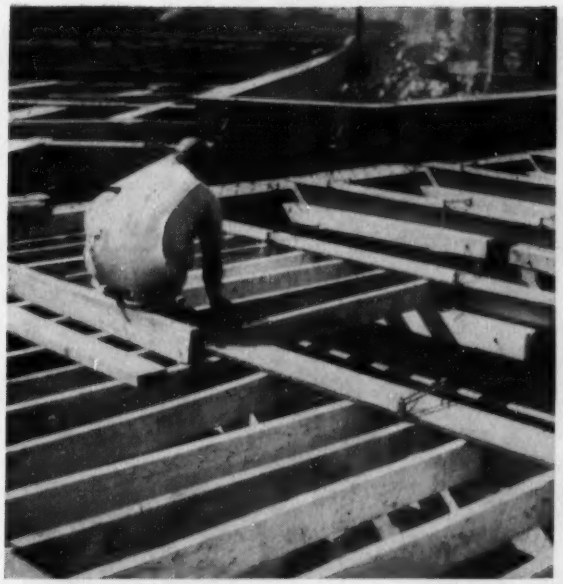


Motorized buggies, power screeds and wide runways are clues that this . . .

Elevated Highway Job Bristles With Good Ideas



BULKHEAD FORM at longitudinal joint incorporates three strips of foam rubber that seal around projecting reinforcing steel to eliminate drilling and patching of holes. It is prefabricated on job into three assemblies: (1) plywood base, 1x2s and one rubber strip; (2) keyway, spacer, 2x4 and two rubber strips; (3) top plate. In left photo, base already has been slid into place and center assembly is being set. At joints between 3-ft lengths, vertical brace is put in base's slot and held by raker to deck, then top plate is nailed on (photo above). Rubber lets forms be stripped easily from around multitudinous bars, gives them better than 12-time use.



SLAB FORMS hang from beams. Small spacers are pre-tacked to top of spruce rib ends so that, when snugged up tight against underside of steel, plywood panel placed later will be flush with top of beam. To avoid cutting standard 4x8-ft plywood sheets to fit varying beam spacing, most of extra area is filled with a 12-in. precut dutchman, while a metal strip takes up the rest (above).

By HENRY T. PEREZ, Senior Associate Editor

JUST BECAUSE the job is up in the air—building a concrete deck for an elevated highway in New York City—it does not mean that the contractor is, too. On the contrary, his down-to-earth construction techniques are getting the job done efficiently. Among the many items worthy of specific mention: A new type of bulkhead form with foam-rubber inserts that seal around projecting reinforcing steel; and a self-raising aluminum elevator to deliver concrete to the deck.

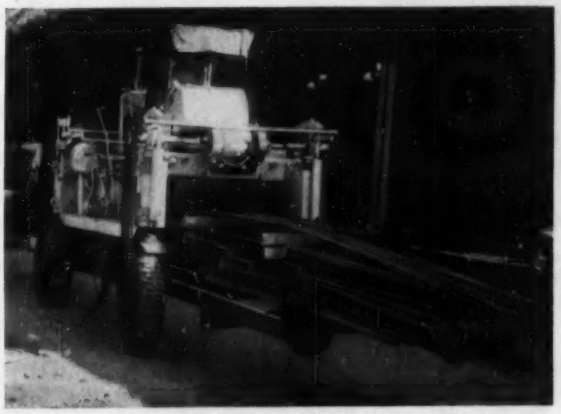
The elevated highway carries through traffic over the busy East River waterfront in lower Manhattan. Some 7,600 ft long and 75 ft wide, the deck is 23 to 31 ft above ground level. Main supporting members are two lines of longitudinal girders, which span between two-column bents that are generally on 80-ft centers. Girders are only 35 ft apart, but they carry transverse built-up floor beams (on 20-ft centers) that cantilever 18 and 22 ft beyond to make the 75-ft deck width. Floor beams, in turn, pick up wide-flange stringers spaced 5 to 6 ft apart.

Plywood and Metal Fill-Out Forms

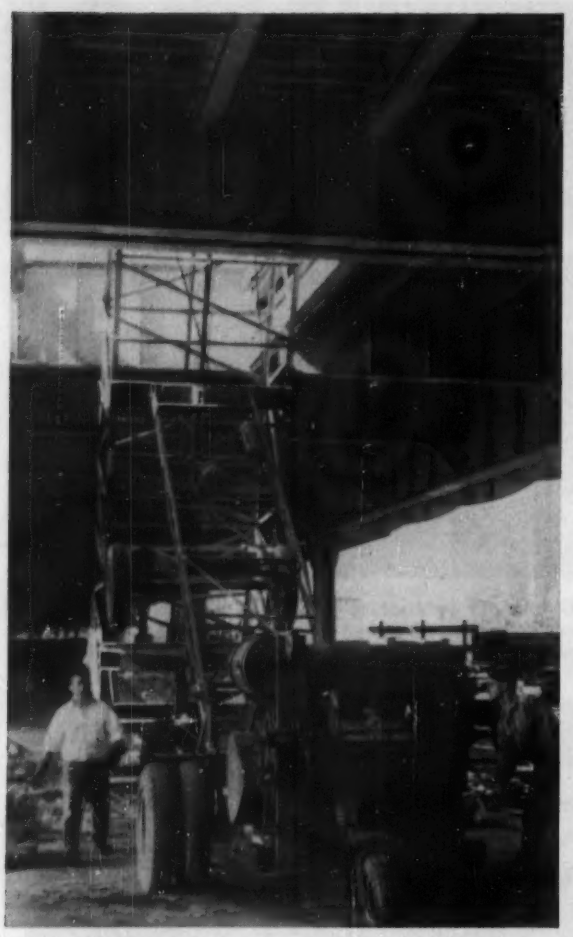
On this steel frame, Euclid Contracting Corp. is building a heavily reinforced structural-concrete deck with a slab depth of 8¼ in.

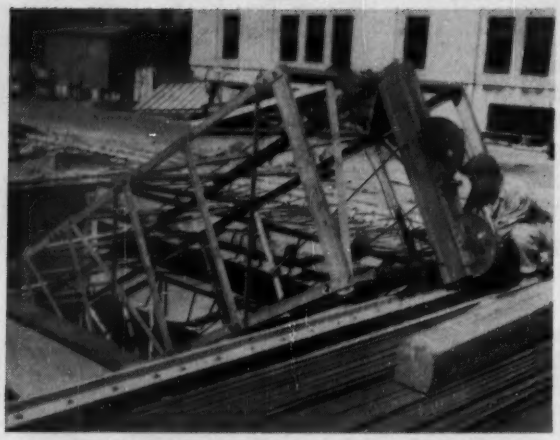
Bottom forms are ⅝-in. plywood. The variable stringer spacing would make formwork extremely costly if the plywood were cut to fit exactly. Instead, standard 4x8-ft sheets are used as far as possible, with precut 12-in. plywood dutchmen to fill out. Final closure to take up minor variations is made with 4-in. wide strips of 16-gage metal spanning between panels and dutchmen.

A tight lengthwise crimp projecting downward into the joint gives the strip the required rigidity and helps hold it in place during a pour. The combination of dutchmen and metal strips practically eliminates



REINFORCING STEEL is delivered from job bending yard by Ross carrier, then hoisted to deck by Link-Belt Speeder truck crane with frame strongback. Job calls for 2,000 tons of reinforcing.





ALUMINUM-TOWER ELEVATOR is lowered for moving ahead to lift concrete for next group of pours. It's a real trick to sneak the 5x7-ft tower, here 51 ft tall, through 10x20-ft opening in deck 30 ft above grade, but combined tilting and sliding handle it. With tower completely lowered, White truck-tractor backs under unit's fifth wheel (far end, right photo) to tow it to new site.

tailor-cutting of plywood. Consequently, all form material can be used an average of 10 times.

Form panels rest on rough 2x6 spruce precut ribs on 1-ft centers. These, in turn, are supported by doubled 2x6 walers suspended from the stringers by Richmond Hanger Frame-Tys on 4-ft centers. The hangers eliminate wedging and give a good tight form.

Transverse bulkhead forms are not needed, because the deck slab pours extend between steel plate expansion joints built into the superstructure every two bays. However, because it is poured half width at a time, the slab must be bulkheaded along deck centerline. And this is complicated by transverse reinforcing steel (⅝-in. bars on 10-in. centers in a top layer and on 5-in. centers in a bottom layer) that must pass through it.

Euclid figured the usual bored or slotted bulkhead form would be too hard to place and strip, and probably would leak excessively. So they worked up a new type of bulkhead (see sketch) that incorporates three strips of foam rubber 1 in. thick. Because the rubber need not be cut out to receive the bars, variations in bar spacing become no problem. When the form is assembled, the bars just press into the soft rubber, which molds itself tightly around them. And, while stripping, the rubber compresses further so the form can be drawn away easily from the reinforcing. These bulkheads get 12 uses before reconditioning.

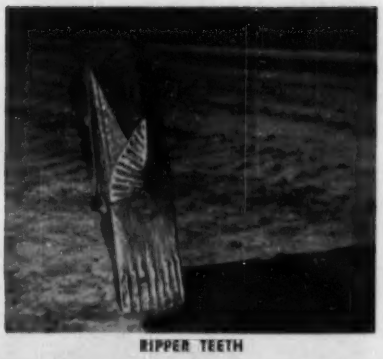
The 20,000 cu yd of concrete for the decking is a controlled ready-mix with 3½-in. slump and 28-day strength of 3,000 psi. It is delivered from a near-by plant in 8½-yd Jaeger transit mixers on Mack trucks. Pours are generally 160 ft long (two bays) and 37½ ft wide (one-half deck width). For the first few pours, the trucks ran up a permanent access ramp to the elevated highway and discharged directly into motorized buggies that delivered the mix to the forms. Later, to speed the work by transferring concrete from truck-mixers on the ground to a buggy-loading hopper on the deck close to the pour, Euclid brought in a special United portable elevator.

Powered by a 95-hp Hercules-driven Lidgerwood hoist, the unit carries a 1-yd skip in a 5x7-ft steel and aluminum tower. Basic tower height is 45 ft, but this can be increased or decreased by 6-ft aluminum prefab sections. Two built-in hand winches make it self-erecting and lowering. When in the lowered position, the elevator rests on rubber-tired wheels and can be moved easily by hand or by Jeep. It also is fitted with a fifth wheel for attachment directly to a truck-tractor. Thus, without dismantling, it turns into a semi-trailer for longer moves.

On the elevated highway job, the elevator is moved

(Continued on page 86)

NEW!



RIPPER TEETH

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a better rod for hard-facing carbon, manganese and all other steels

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SHOVEL BUCKETS AND TEETH

Here's where your search ends for better wear resistance at low cost! The new COATED TUBE STOODITE gives you everything... *more wear protection, more impact strength, faster deposits, better weldability!*

Field tested two full years, we're sure of our answers... *It's actually doing the work of rods costing twice as much!*

Try 50 lbs. today—compare it with rods of any price! See your Stoody dealer (listed in the "yellow pages" of your phone book) or write for literature.

STOODY COMPANY

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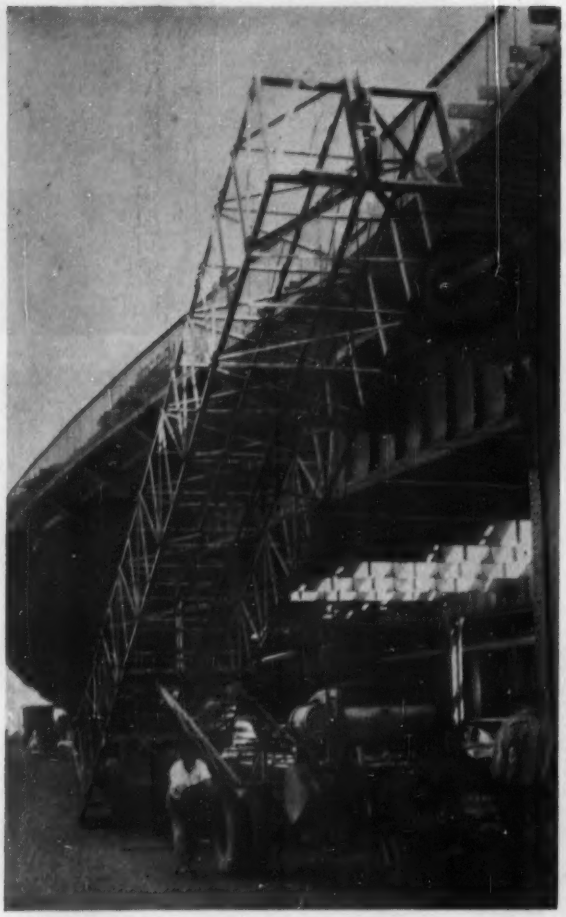
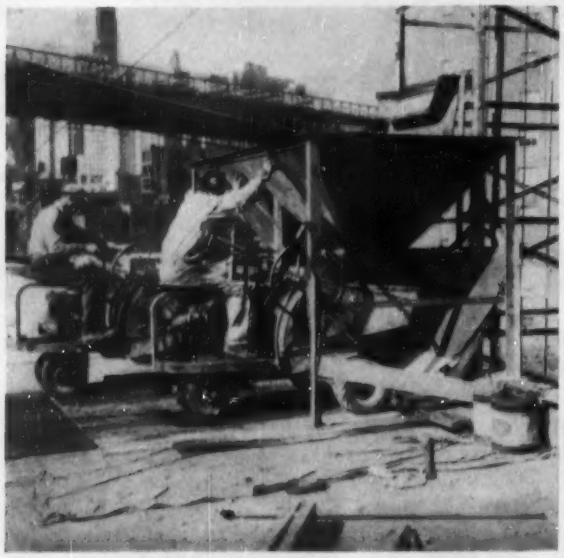


TOWER ERECTION alongside deck is easier than threading it up through superstructure, so this setup is made where traffic and building clearance permit. Geared hand crab with line to tower base gets unit upright in a hurry. Then its 1-yd skip starts raising concrete to deck. Concrete is a 3½-in. slump 3000-lb ready-mix delivered by Mack trucks carrying 8½-yd Jaeger mixers.

(Continued on page 90)



CONCRETE DELIVERY is handled by Whiteman Power Buggies whose ½-yd bodies are charged from CMC twin hopper. Hopper gates are fitted with extension handles so operators can control loading of their own buggies; oiled plywood sheet beneath it facilitates turning buggy drive wheels 180 deg for backing out. Wood runways 6 ft wide are kept free for one-way travel only.

"We're rock specialists—

and so are our MICHIGANS"

says Dominick Cutrupi, Jr.

Project: Sewage Disposal Plant, West New York, New Jersey
- Trench 12′ to 20′ deep, practically all through solid rock
- Install 2000 ft. of 84′ diameter concrete pipe, 8-ton sections.

Contractor: D. Cutrupi & Sons
Fort Lee, New Jersey

Equipment: 3 MICHIGAN ½ yard shovel cranes
Two TLDT-20, one TMDT-16

"10 hours a day, six days a week muckin' out rock, doing work of ¾ yard machines—our MICHIGANS take big-league punishment.

"Just as tough as the trench job, almost the whole length through solid rock, is the handling of pipe. A pipe section is lifted off a flat-bed truck by the crane, one end is butted against the front of the machine, and the crane is 'walked' about 300 feet to point of installation—a really delicate operation.

"That MICHIGAN combination of delicate 'handle-ability' and fast, positive air-control action is what we like most.

"Maintenance?—On our seven-year old MICHIGAN TMDT-16 we've spent less than $1000 on maintenance and repairs.

"Our MICHIGANS make money for us."

Check the MICHIGAN* Line, point by point, against all others . . .

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- **Rugged chassis—for long life**
- **Fast, smooth swing**
- **Easy, quick maintenance**

and you'll see right away how you can

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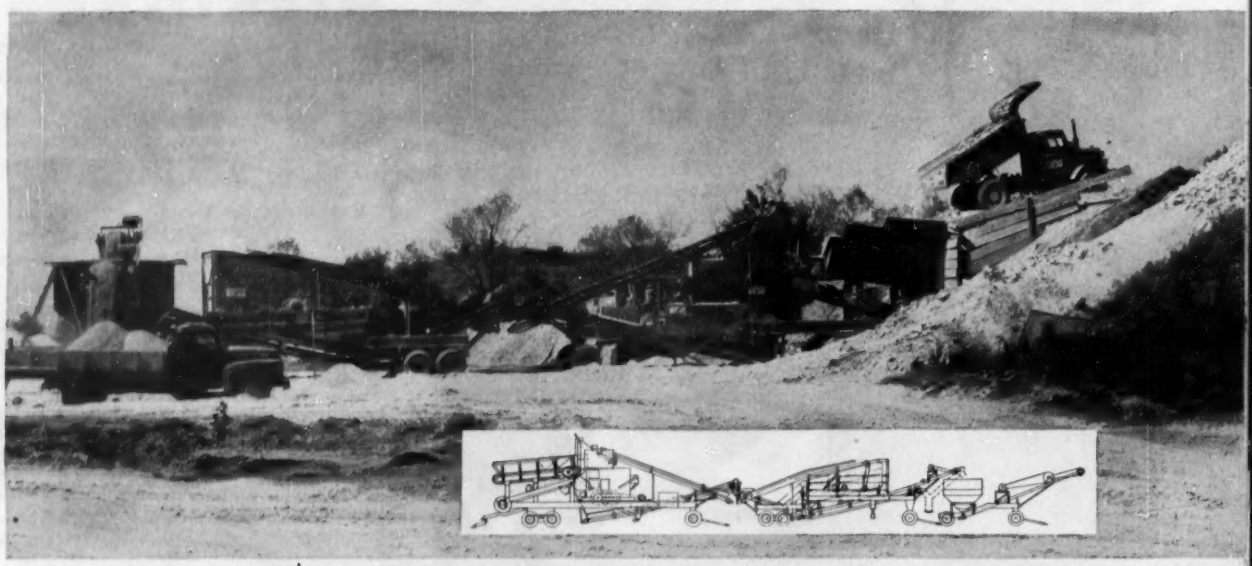
A UNIVERSAL production report to crushing plant operators

Plant Site	Herington, Kansas
Operators	Anderson-Oxandale
Requirements	High tonnage of aggregate to meet state's exacting specification. Frequent moves and changes in product specification required.
Equipment	Universal 3240 Impact Master. Universal portable screening and blending unit.
Type of rock	Dolomite limestone.
Production	Currently they are meeting a difficult specification calling for a large percentage of minus ¼ inch. They are producing up to 150 yards per hour of which 100% passes a one inch screen, 90% passes a ¾ inch screen, 50-60% passes a ¼ inch screen. When desired Anderson-Oxandale can reduce the production of minus ¼ inch material by at least 50%.



Anderson – Oxandale's portable 3240 Impact Master, crushing, screening, blending and loading plant operating near Herington, Kansas.

Anderson — Oxandale had to have a crushing plant that could be moved frequently with a minimum of down time, produce high tonnages of top-quality aggregate at each set-up, and meet exacting specifications. The Universal Impact Master (portable) with *Controlled Impact Action* combined with Universal's portable screening and blending unit was the answer.

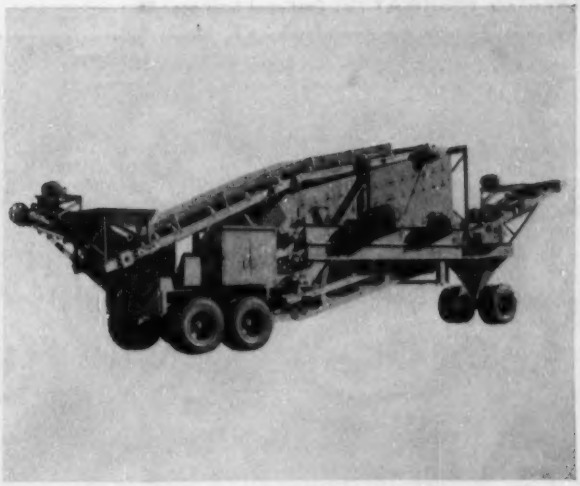
The Impact Master, with *Controlled Impact Action* gives them four important advantages: (1) Greater control of the finished size of your material. (2) Cleaner, more cubical aggregate. (3) Lower operating cost — it requires less horsepower per ton. (4) Lower maintenance cost.

What Is Controlled Impact Action:

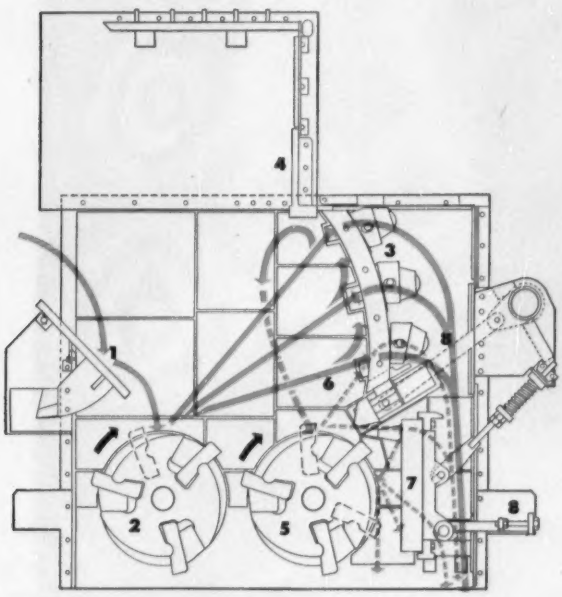
Control point 1: Controlled feed chutes the rock into the unobstructed path of the first rotor hammer circle for terrific impact, providing maximum unobstructed penetration. The angle of the plate can be quickly changed to handle rock of different size and density and meet varying quarry conditions. Incoming material penetrates the first rotor hammer circle at the correct angle for efficient breaking. **Control point 2:** you control the range of sizes by simply regulating the speed of the rotor hammers. **Control point 3:** you can easily adjust the stripper bar and lower screen grate to get the percentage of sizes you want.

With these three methods of control, you get what you want. It's no hit or miss proposition. "Controlled Impact Action" is more than a phrase with Universal. It's the key to the way all Universal Impact Masters produce more aggregate of higher quality to exact specification at lower cost.

Portable 3240 Impact Master with 3 speed transmission drive from diesel power mounted to the side. Slide mounted 36″ x 16′-0″ portable apron feeder. Eighteen inch closed circuit return conveyor from portable screening unit. 30″ delivery conveyor to portable screening unit.



Universal portable screening and blending unit. All electric driven with 5′ x 14′ 3 deck inclined gyrating screen equipped with ball tray. Two 30″ forward delivery conveyors and one 18″ side delivery conveyor. Positive blending chutes with gates control different aggregate specifications. 18″ return conveyor to Impact Master.



1. Adjustable feed plate
2. First rotor hammer
3. Deflector screen grate
4. Feed chute backplate
5. Second rotor hammer
6. Stripper bar
7. Bottom screen grate
8. Adjustments

How the Universal Impact Master works:

The diagram at left shows the flow of material. Adjustable feed (1) chutes the incoming rock into the first rotor hammer circle at proper angle. Rock is hit in motion, exploded into cubical shaped pieces by terrific impact of the rotor hammers, and at the same time hurled toward the deflector screen grate (3) where finished sizes are immediately discharged. Oversize particles are deflected upward, hit the feed chute back plate (4) and drop down into the path of the second rotor hammer circle (5) where they are reduced by impact and projected toward the bottom half of the deflector screen grate and the lower screen grate for immediate discharge. Both rotor hammers rotate toward the discharge opening. Material always flows rapidly in one direction. No grates, screens or bars obstruct the discharge opening. Large expansion chamber is also completely free of obstructions. All breaking is done by impact. There is no attrition, abrasive or grinding action. Thus wear is kept to a minimum.

More and more operators are turning to the Universal Impact Master, with "Controlled Impact Action." Its high production capacity, excellent performance, and simplicity of construction just naturally results in a more efficient, more profitable operation. Tonnages up to 750 tons per hour. Available in sizes: 3240, 3645, 4250 and 5260. Write for complete information today.

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UNIVERSAL GAVE CEDAR RAPIDS ITS ORIGINAL FAME FOR QUALITY CRUSHERS **IN CEDAR RAPIDS SINCE 1906**

PMCP **UNIVERSAL**

SLAB FINISHING is done with Whiteman machine, whose two powered reciprocating 20-ft screeds make strike-off easy. Two such machines, overlapping on centerline, covers 37½-ft wide slab pour. Barrow-mounted Mall vibrator helps move buggy-dumped concrete.

ahead in 6-·700-ft jumps (four double bays) to cut down buggy-haul distance. It is set up alongside the deck, where possible, but lack of clearance on the water side and street traffic on the other side usually prevent this. Instead, the elevator must be poked up through the deck itself.

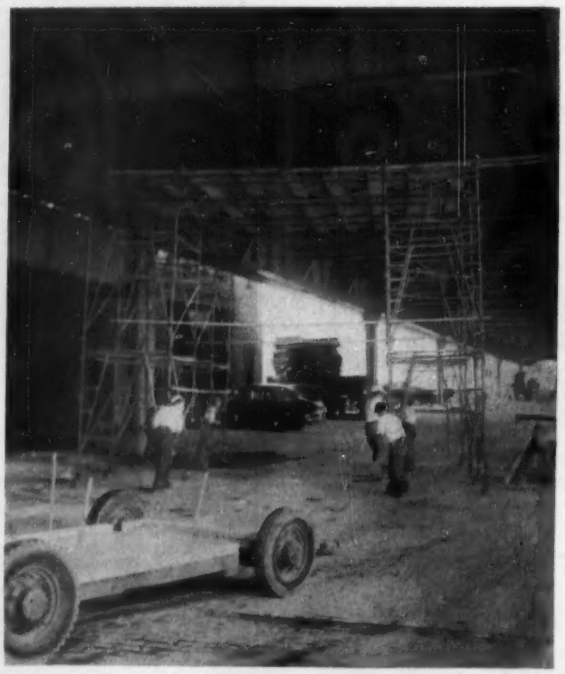
Removal of one stringer leaves a 10x20-ft opening for this operation. Then, by simultaneously tilting the tower and sliding its base, the elevator is threaded up into the hole. Despite the tight clearance and the necessity for jockeying the tall tower into place, two men can lower, move and re-erect it in just a couple of hours.

The elevator's skip automatically dumps concrete into a CMC twin hopper on deck, and Whiteman Power Buggies deliver the mix to the forms. Over unpoured bays, or in that being poured, the ½-yd machines travel on wood runways. These are made up of 6x7-ft panels, each of which is supported by two 2x6-ft bolsters 14 in. high. The latter's 4x4-in. legs rest on the slab forms. To maintain uninterrupted one-way traffic, runways are set up in the shape of a broad rectangular U with its base at the point of pour.

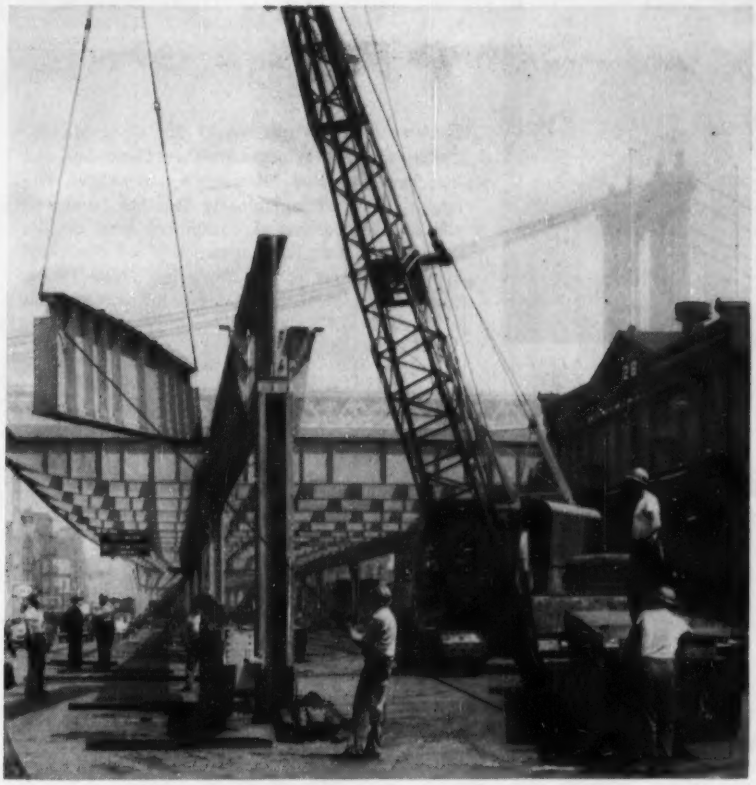
Buggy-dumped concrete is spread by two Whiteman screeding machines 20 ft wide. These are pulled along on three lines of T-bar screed strips that are supported by chairs built into the Richmond form hangers. Ahead of the screeds, concrete is consolidated by Mall vibrators. Behind them, it is hand-floated, straight-edged, broomed, and spray-cured with Hunt compound.

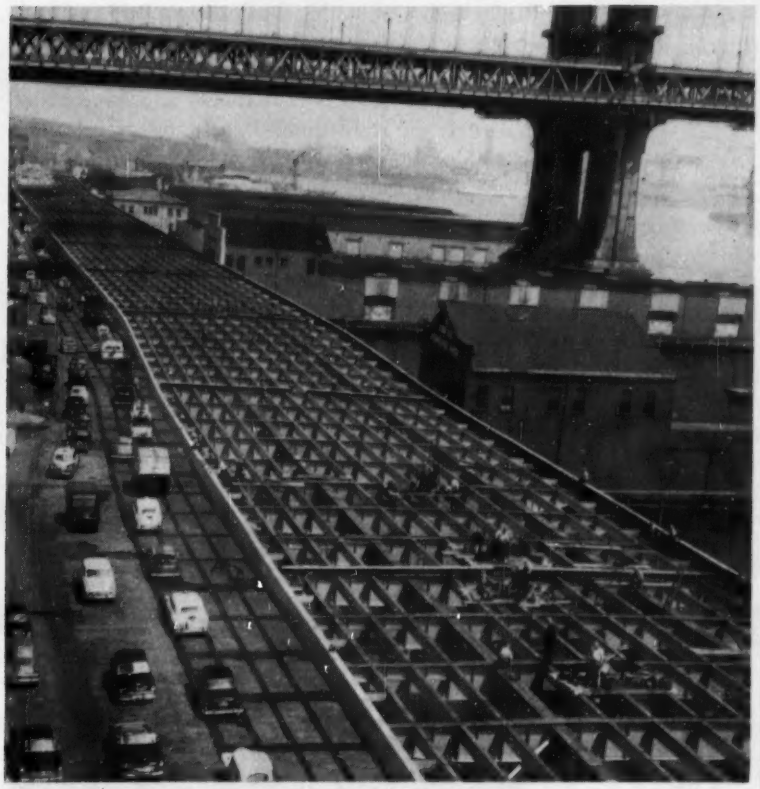
Usual progress is to complete a pour in 5 to 6 hr, and to make one pour per day. These have ranged from 180 to 250 cu yd. Yet, because of the broad 6-ft runways kept for one-way travel, a fleet of just four of the Power Buggies can handle even the maximum pours easily—a rate of better than 10 yd per hr per machine on an average 300-ft haul.

The elevated highway is being built by the office of the Borough President of Manhattan, for whom Anthony J. Dongardo is chief engineer and John T. Carroll is resident. General contractor is New York's Felhaber Pile Co., with E. Sirles as superintendent. Subcontractor for steel superstructure is Bethlehem Steel Co. Bob Carpenter is their superintendent, under George P. Adair, New York district manager of erection. The structural concrete deck is being built by Euclid Contracting Corp., New York. Charles W. Spero is Euclid's superintendent, assisted by Ralph Tilleli.



FORM STRIPPING from underside of deck slab is facilitated by Albro rolling scaffold, here being pushed down to next bay. Trailer in foreground will be loaded with stripped lumber for delivery to deck for re-erection. Sasgen hand-operated derrick, placed in bay not yet formed up, also helps lift form material.





STEEL ERECTION continues, up ahead of concrete deck construction (extreme left, lower photo). Superstructure calls for 15,600 tons of structural steel for 90 spans, including girders as long as 120 ft and up to 8½ ft deep. In upper photo, Manitowoc Speedcrane unloads 35-ft center section of a floor beam.

To help you with...

Collective Bargaining

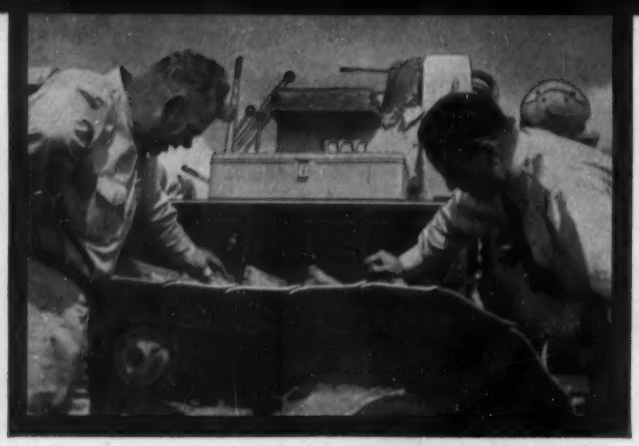
CONTRACTORS WILL FIND plenty of helpful information in "Collective Bargaining: Negotiations and Agreements," by Selwyn H. Torff (McGraw-Hill Book Co., New York, $5.50), which deals with the practical side of collective bargaining.

At the outset, the author states that the purpose of the book is to describe the process of collective bargaining and how it works; to set forth the issues that arise most frequently between labor and management, and arguments advanced by each. He does so objectively—not passing judgment on the contentions of either party. As he says, "Once a book begins to label union or management arguments and agreements as 'good' or 'bad,' 'fair' or 'unfair' it must abandon its claims to objectivity and join the already overburdened list of partisan writings on this controversial subject."

On studying the book, you will find sample clauses typical of collective agreements. These can be beneficial to the contractor confronted at the bargaining table with new issues or with a revision of existing contract provisions. Thus, for example, there is a description of the growth and development of paid vacations, and samples of provisions found in union agreements where management and labor have agreed to vacations with pay. A chapter outlines the ramifications of paid holidays, issues that arise, and how they are finally agreed upon.

Mr. Torff briefly describes the growth of unions in the United States and development of the legal status of collective bargaining. One section — a substantial part of the book—covers the negotiation of economic issues, such as wages, overtime, payment for reporting time, time not worked, etc.

This book should be studied by contractors and others who negotiate with labor unions but can afford to spend little time studying the fine points of the technique of collective bargaining. It is written in language that can be clearly understood by the layman, yet is sufficiently advanced and up-to-date to prove useful to the experienced.—L.B.K., Jr.



They're on the right track! Mr. G. G. McAfee (left), official of Winston Brothers Company, and Mr. Tom Gearhart, Standard's Automotive Engineer, have worked closely together to secure effective lubrication of equipment used on the vast Rocky Mountain construction job described below. This sort of teamwork has helped make "molehills" out of mountainous lubrication jobs.

They made

"MOLEHILLS OUT OF MOUNTAINS!"

To bring water from the Colorado River to the eastern plains of Colorado, men and machines have driven a 13-mile tunnel through the Rockies, hacked out vast reservoirs, and built great dams of earth and rock fill. They have literally made "molehills out of mountains!"

Winston Brothers Company, Constructors and Engineers, of Minneapolis, has played a major role in this vast construction project. Under the most adverse conditions, the Winston team of men and machines has accomplished the toughest of earth-moving jobs . . . on schedule! Important to the successful operation of Winston Brothers' wide array of gasoline and diesel powered equipment has been Standard Oil's fleet lubrication service and the performance of STANOLUBE HD-M Motor Oil.

Despite continuous operation of equipment, severe overloads, high engine speeds, and exposure to dust, sand, and water; STANOLUBE HD-M has kept engines clean and protected against wear. A minimum of maintenance has helped Winston Brothers keep equipment working on a basis of two 8-hour shifts, 6 days a week.

Standard's fleet lubrication service has accomplished the imposing job of supplying the right lubricants for the right jobs right on schedule. A Standard Oil Automotive Engineer has worked closely with Winston Brothers on all phases of lubrication. One of his big jobs has been that of coping with varying seasonal and operational needs to make sure that proper grades and types of lubricants have been available and have been applied at the right time. Despite adverse conditions of location and weather, lubricants have been delivered on schedule.

The fleet lubrication service and the heavy-duty motor oil that helped Winston Brothers make "molehills out of mountains" can help you make important savings. You can reach a Standard Oil Automotive Engineer by phoning your local Standard Oil office. Or write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

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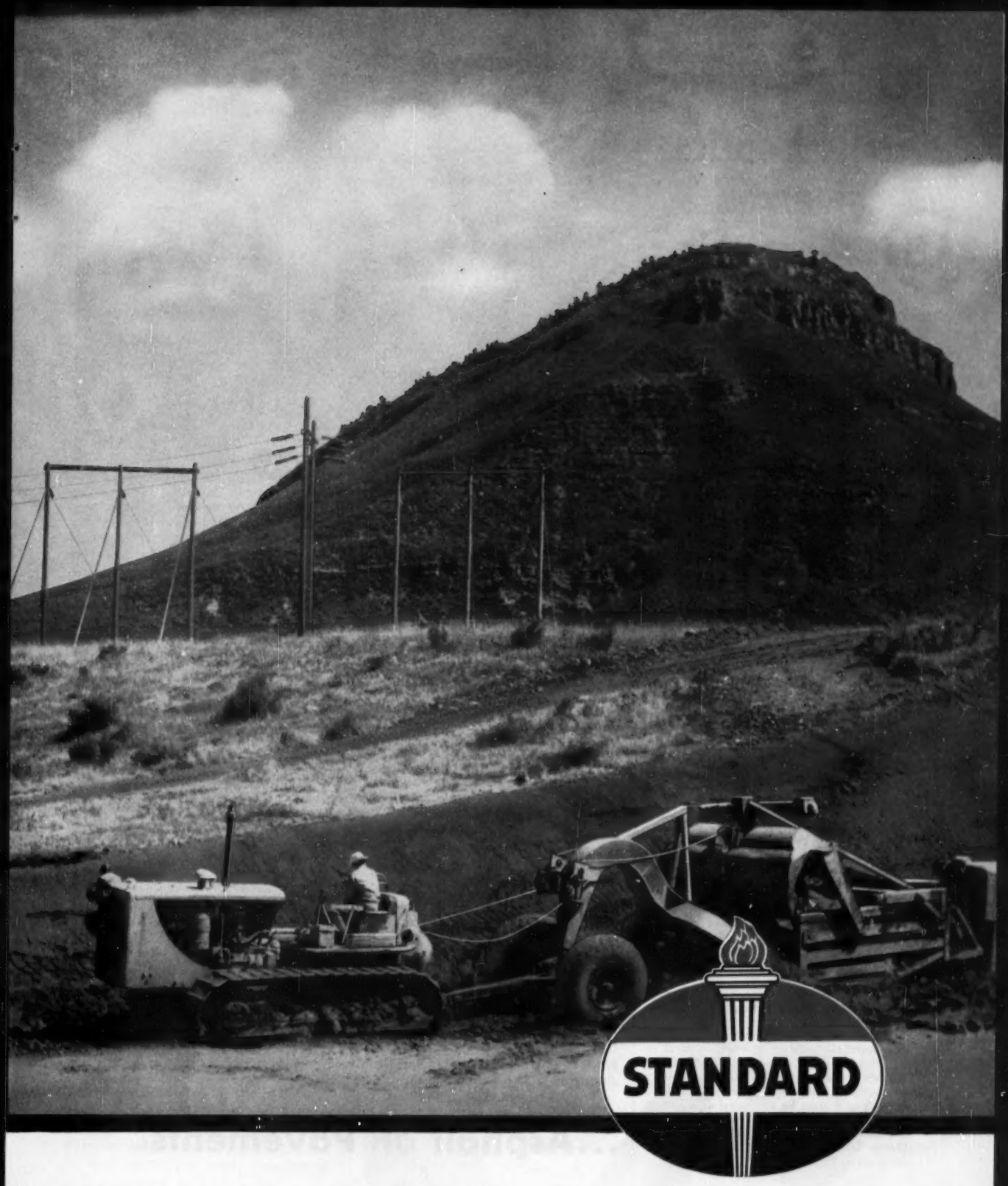


STANDARD OIL COMPANY (*Indiana*)

Ask the man behind the "gun"

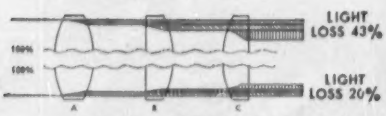
Coated optics give you this—not this—

Model 3000, $195.00*, complete with tripod.

with a White Universal Level-Transit

HERE'S what coated optics do for you. You can put in a full day without eyestrain or headache. There's less chance for a mis-reading. You get a clear, sharp sight — not a fuzzy image. What's more, you get your reading in far less time. Check this diagram. See for yourself how coated optics pass through up to *40% more light*, provide a clearer image contrast.

PASSAGE OF LIGHT THROUGH UNCOATED LENSES



PASSAGE OF LIGHT THROUGH COATED LENSES

And there's more!

White Universal Level-Transits also offer you internal focusing, guarded vertical arc and ball bearing race which insures smooth operation, even in sub-zero temperatures. Check one out on your next trip. You'll soon be convinced a White can make your work faster, easier, more accurate . . . Write for Bulletin 1053. DAVID WHITE CO., 343 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

Expert REPAIR SERVICE on all makes, all types of instruments

*Prices subject to change without notice.

BITUMINOUS MIX POURS into hopper from truck pushed over welded wire fabric reinforcing by paver. Note sled along side of paver to flatten mesh ahead of screed.

Wire Fabric Reinforces...

WIRE FABRIC IN FLAT SHEETS comes in handy size, 11½x7 ft. Reinforcing mesh is laid directly on original pavement being covered, mix is laid 3 in. beyond outer edges.

...Asphalt on Pavements

WIRE FABRIC REINFORCING IN asphaltic concrete pavements is being applied on an increasing scale around the country to further some tests made for the first time in 1946 on U. S. 90 in Texas.

Welded wire fabric is being incorporated into bituminous paving to determine the effectiveness of the wire mesh in preventing pavement rippling and "piling up" and in reducing formation of cracks which permit entry of water bringing on subsequent early damage.

A recent test pavement of 3,000 sq yd was laid on 16th St. in Washington, D. C. Paving was done in sections with reinforced sections alternating with unreinforced sections for purposes of observation and comparison. Wire fabric used had 10-gage wire, welded in 6x3-in. rectangles, which came in flat sheets, 11½x 7 ft.

Sheets were laid directly on the existing pavement, overlapped 6 in. and tied at several places to prevent shifting as trucks and paver rolled over them. The 11½-ft sheets came within 3 in. of both edges of the 12-ft course of asphalt laid by a Barber-Greene paver.

To prevent the wire fabric from catching on paver parts as it passed over, transverse wires were faced down so that the spreader, in effect, slid along the longitudinal wires. Sheets were lapped away from the paver, like shingles down a roof.

Sleds Iron Them Flat

To keep the welded wire ironed out flat on the pavement as bituminous mix is placed, the contractor attached six "sleds" to the paver. The sleds were 12-in. steel curbing forms suspended open-side up from a steel bar along the front of the machine. Four sleds trailed between the crawler tracks, and there was a single one on each side of the paver.

Donaldson Paving Co. of Washington was the contractor.

Manager P. H. Roettger of the Indianapolis Airport used welded wire fabric in laying asphalt topping on a 22-yr-old Portland cement concrete runway 104 ft wide and some 2,500 ft long.

Roettger applied wire reinforcing only over the transverse expansion joints between slabs of the existing concrete runway. He used a 5-ft width of wire over the joints, many 1½ in. wide, to prevent cracks from striking through to the new surface. Fabric was omitted from some joints marked for later comparison.

A base course of coated and heated 1¼-in. aggregates was laid and rolled down on the runway. Wire fabric, 100 ft to a roll, was laid across the now-covered expansion joints (marked by stakes in the boundary turf, leaving a 2-ft clearance at each edge.

Only enough wire was unrolled for a single pass of the Barber-Greene paver. As each succeeding pass was made, more fabric was unrolled and some asphalt shoveled on the fabric ahead of the paver to

(Continued on page 97)

PROTECTION – WHERE ACCIDENTS BEGIN

BULLARD-BURNHAM SAFETY HOOKS

At last a 100% safe hook for every type of equipment; utility and chain hoists, horizontal tuggers, come-a-longs, cranes, block and tackle or snatch blocks. Safety gate automatically locks closed and cannot be disengaged accidentally. A touch of the finger releases the lock to open gate. If the hook is sprung, even ¼ inch, gate will swing free, warning workers. All hooks used are standard drop forged hooks with B & B safety gates of non-corrosive brass. Sizes available #2 through #16A. Return spring on gate is available at additional cost. Write for descriptive circular.

E. D. BULLARD CO.
SINCE 1898
SAFETY HOOK DIVISION
275 EIGHTH STREET
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With gate open hook's throat is entirely free

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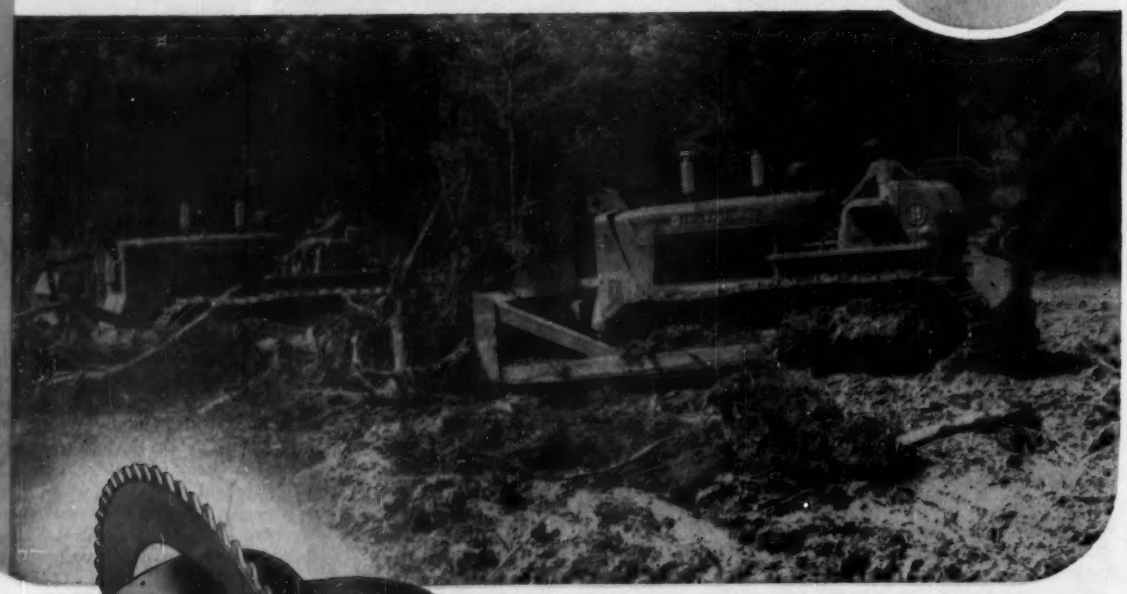
"Velvetouch is the only friction material to withstand ... constant hard useage"

George Loper



Keeping approximately 600 pieces of construction equipment out of the repair shop and on the job, is a mighty important responsibility. But George Loper, Equipment Superintendent for James D. Morrissey, Inc., Philadelphia, takes it in stride . . . thanks to Velvetouch all-metal clutch plates, facings and brake linings.

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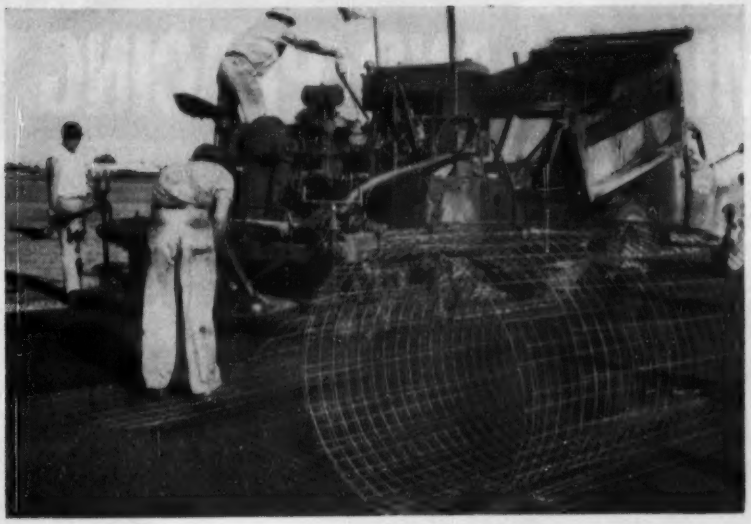
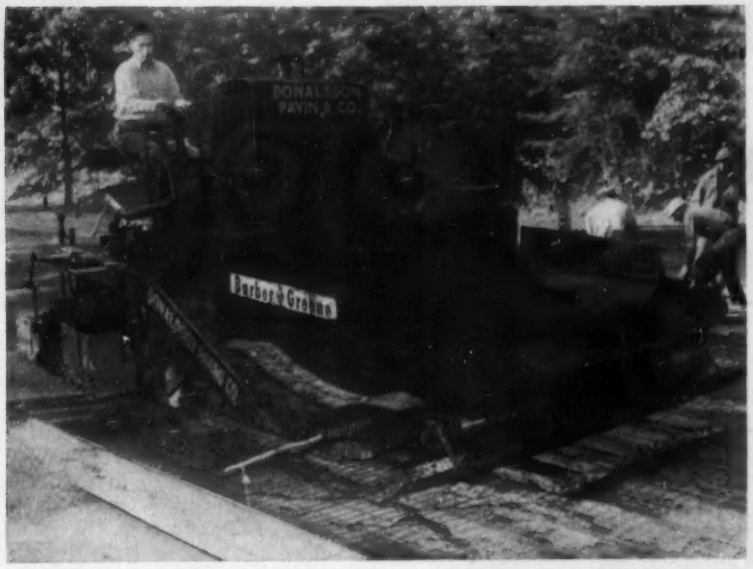


WIRE IN ROLLS is laid over transverse joints of old Portland cement concrete runway, between two courses of asphalt, to prevent expansion joint cracks from striking through.



START OF STREET PAVING is moving of paver over curbing forms which are fastened to a bar across front of machine. Four "sleds" are between crawlers, one on each outer side.

hold it down. Workmen stood on free ends at times to keep the wire from catching on the paver.

The second course, also 1¼-in. coated materials, then was rolled and finished off with Seal Cote, 0.2 gal per sq yd. This was followed by No. 12 limestone chips, 15 lb per yd and heated to 215 deg F so they would "fry in" to the surface to form a tough coating.

The busy Indianapolis runway (up to 600 plane movements per day) is checked constantly since resurfacing. Early reports indicate that some cracks are appearing over joints not covered by welded wire fabric.

Other trial applications have been made in several mid-west states and results are being tabulated by the Wire Reinforcement Institute, Washington, D. C., who will make public further information and suggestions as test data are obtained. In Indianapolis also, ten bus stops have been resurfaced with wire-fabric-reinforced asphaltic concrete in an attempt to reduce rippling.

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original side-swing
CLAMP
that
cuts
SHORING COSTS up to ONE-HALF

NOW you can shore floors, arches, stairways... build scaffolding in half the time with unskilled labor and E-Z Shore Clamps!

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Shoring lumber (2x4's or 4x4's) may be used over and over. No splitting, nailing or sawing. Use any piece 2' long or longer.

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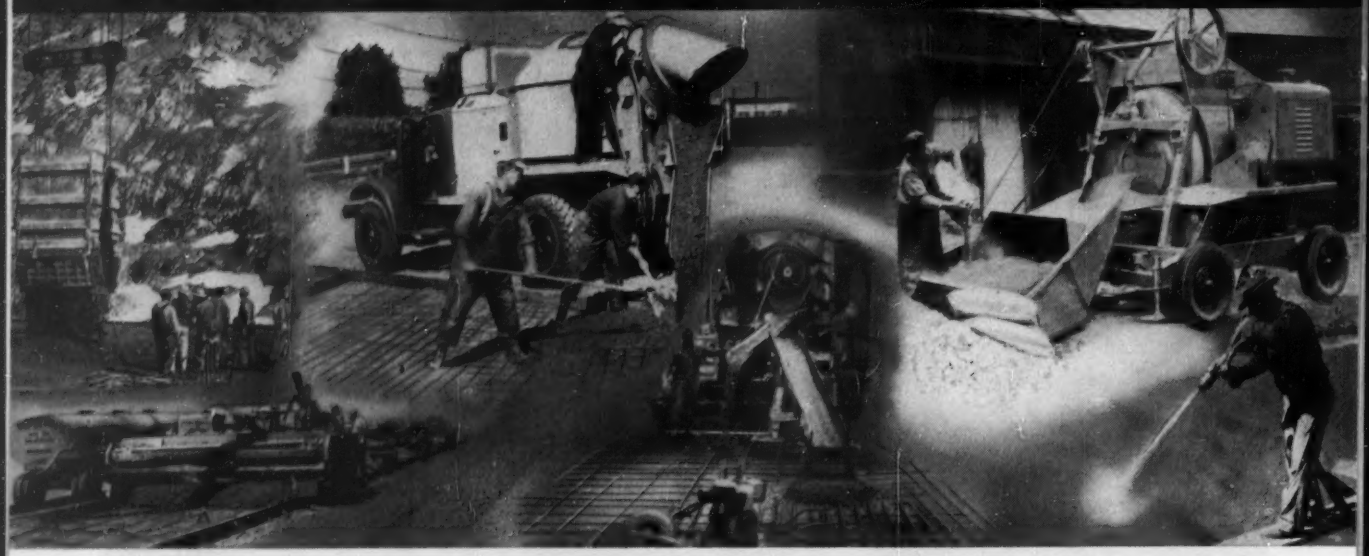

4. Scale Adjustments and Weighing Tolerances

By THEODORE B. APPEL, JR., Chief Engineer, The C. S. Johnson Co., Subsidiary Koehring Co.

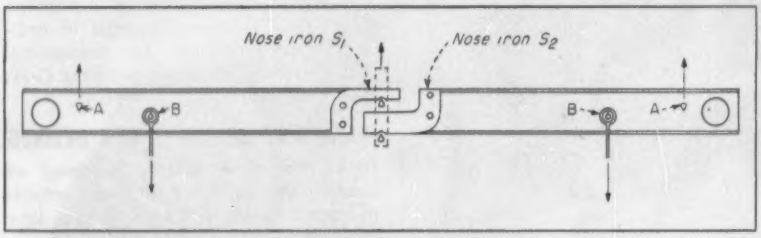

Fig. 1 . . . COMMON MEANS of adjusting scale ratio. Pivot seat S-1 and S-2 can be moved back and forth slightly when bolts are loosened, through oversize bolt holes.

COUNTERWEIGHT ADJUSTMENT to zero-balance a scale has been discussed in earlier paragraphs. The other major check is adjustment of the scale ratio.

Of the two major adjustments the zero-balancing adjustment is by far the more common. If there is a build-up, or accumulation, the scale may require zero adjustment several times during a day's operation. Certainly zero-balance should be checked at the beginning of each day. Checking this is an easy matter for scales equipped with dials and those with a zero-balance beam.

Scales are checked to make certain that the lever system ratios are correct before shipment is made from the factory. Each scale has a means of adjusting this ratio. As long as all parts of the system are in good condition and do not need to be replaced, the scale should not require ratio adjustment. However, for one reason or another, they do get out of adjustment, which is the reason that periodic scale tests must be made.

• **The scale system ratio** must be correct to weigh accurately. Thus, for a system designed with a 500 to 1 ratio this ratio must be 500 to 1, not 499.98 to 1 or 500.02 to 1. Even though the lever pivots are located with great accuracy and fixed in the levers with great care, it is not possible to manufacture perfect levers. And it is not necessary because each scale has means to adjust the ratio. This adjustment need be no more than that required to compensate for the inaccuracies of manufacture.

Adjustment of Scales

Fig. 1 shows a common means of adjusting the scale ratio. The pivot seats, S-1 and S-2, are connected to the long arms of the collecting levers. There is a small amount of play in the bolt holes which allows (when the bolts are loosened) the pivot seats to be moved back and forth a short distance thus changing the length from the pivot seat to supporting pivot, A. Since the distance between the supporting pivot and the hopper pivot, B, remains unchanged, moving the pivot seats, S-1 or S-2, changes the ratio of the collecting levers.

Changing the ratio of this one lever will compensate for the errors

(Continued on page 100)

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THAT GOES WITH
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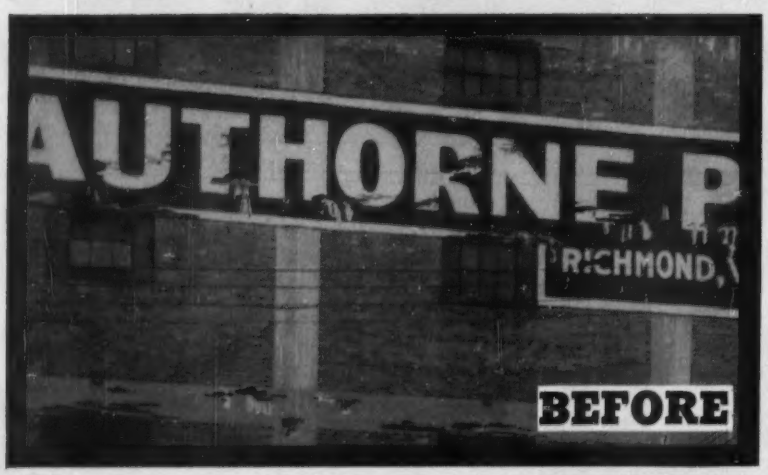
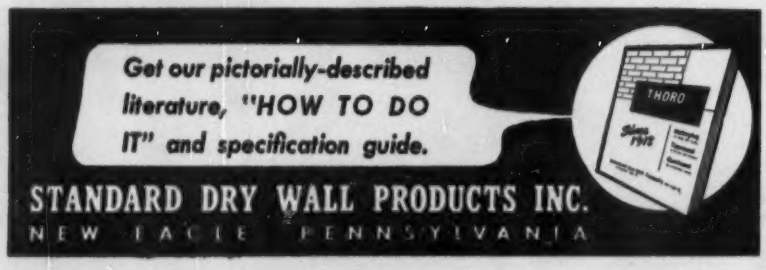


Constant weather exposure over the years caused the masonry of this building to disintegrate. If this unsightly condition had not been corrected it would have finally imperiled the structure of the building.

All concrete spandrel beams, columns, window heads and brick sills were patched and brought flush with surrounding surface by the use of The THORO System product, THORITE, a twenty-minute set, nonshrink, patching mortar. Two brush coats of THOROSEAL were then applied over entire reinforced concrete surfaces, to prevent further disintegration, also to beautify building.

CONTRACTOR: Southern Waterproofing and Concrete Company, Inc., 1704 Arlington Road, Richmond, Virginia.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CONCRETE . . . Cont'd from p. 98

in the manufacture of not only the collecting levers but also all other levers in the scale system. For example, if the ratio of the collecting levers is exactly right and the ratio of the other levers in the scale system is too small, making the ratio of the collecting levers greater than their correct value by a sufficient amount will compensate for the deficiency in ratio of the other lever system members.

The slideable pivot seats S-1 and S-2 are known as nose irons. Ratio adjustment by means of nose irons is the most common method of scale ratio adjustment found on batcher scales.

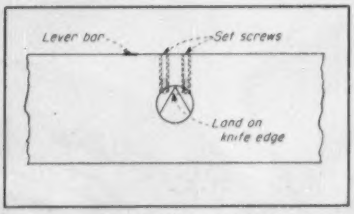


Fig. 2 . . . PIVOT that is free to turn in its hole can be rotated in either direction for adjustment, is locked with set screws.

Fig. 2 shows another arrangement which will accomplish the same purpose. It shows a portion of a scale lever. The pivot is not keyed to the lever bar but is free to turn in the hole in which it lies. The two set screws have rounded points which bear against a land or flat surface on the knife edge. Since the two set screws are on opposite sides of the centerline of knife edge, turning the one screw in and backing the other screw out will cause rotation of the knife edge about its center, tilting the blade slightly to one side or to the other.

Tilting the blade to the right or to the left will increase or decrease by a very small amount the ratio of the lever in which this adjustable knife edge is mounted. Adjusting the ratio of this one lever will compensate for the errors in manufacture of the other members of the lever system, as explained above.

The foregoing paragraphs have assumed that the adjustment of the scale lever ratio only compensates for the inability on the part of the manufacturer to manufacture levers in which the pivots are exactly and perfectly located. Actually, such is not the case, for inaccuracies in the manufacture of the poise weight of a weighbeam, or a variation from the theoretical of the resisting pull of a dial unit

LARGE BATCHERS require accurate scale adjustments to meet job specifications and control production costs. This Butler unit operates on a scow for Construction Aggregates Corp.

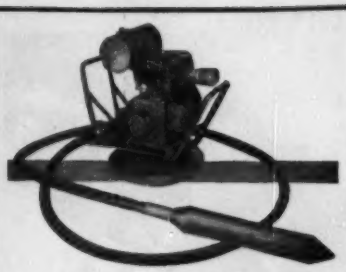
may be compensated for by adjusting the scale lever ratio.

In the case of a multiple batcher where more than one weighbeam is used, adjustment of the scale ratio will not take care of inaccuracies in the manufacture of the poise weights because it cannot be assumed, nor will it ever be found, that all the poise weights are in error by the same amount.

When a scale is tested before leaving the factory the nose irons are positioned properly in the cases where the adjustment is by means of movable nose irons, and the adjustable knife edge is tilted to the right or to the left a proper amount in the case of scales using an adjustable knife edge. If nose irons are used, the bolts are tightened securely, and further, the position of the nose irons must be accurately, clearly and permanently marked so that the nose iron can be returned to its correct position should the bolts become loose allowing movement.

Set screws of adjustable knife edges usually are backed up with a second set screw to insure that the adjustable knife edge cannot move. These precautions practically guarantee that the ratio of the scale lever system will remain unchanged for a considerable time unless the scale is abused or damaged.

• **Check a new batcher scale** with test weights after installation is complete and prior to its use. Periodic checking at regular intervals, also with test weights, should be normal practice. For this reason, every plant owner should equip himself with a set of test weights so that these checks can be made. Unless the scale is used solely in conjunction with a concrete products plant the scale will be checked from time to time by the local sealer of weights and measures, or by some governmental, federal, state or city inspector. The smart operator will not rely



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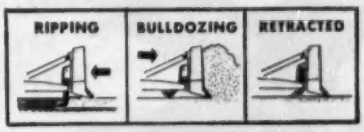

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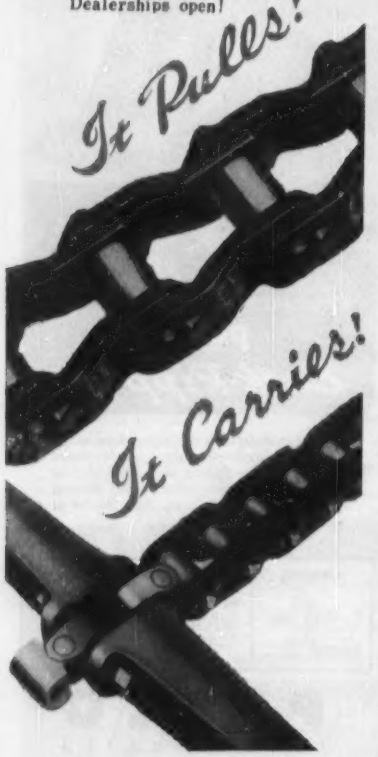


wholly upon these checks, but will check his scales with his own test weights from time to time, because the checks made by these officials may be too infrequent.

It is better to know beforehand that your scales are out of adjustment than to be informed by these officials, and it may save you a lot of money. Accurate control of the quality of concrete is becoming increasingly important.

Information on how to re-ratio a scale generally is furnished by the manufacturers. If this data is not included in the instructions furnished with the batcher, most manufacturers will be glad to supply it upon request. If the scale has been sealed by a sealer of weights and measures or has been checked by a highway official, and is still being used to produce concrete under a specific contract, these officials must be notified prior to re-use of the scale so that they can apply their stamp of approval.

Weighing Tolerances

When a batch is weighed up, either manually or automatically, none of the material weights is absolutely correct. There are two major errors which make correct weighing impossible. Scales are never perfect, there being always a slight error in any weighing operation. Many times greater is the error resulting from the inability on the part of the operator in manual weighing, or of the automatic devices in the case of automatic weighing, to cut off the flow of material into the weigh hopper at the exact point. This can be understood if we consider the case of a very large aggregate, such as 6-in. cobble, which is commonly used in batches for mass concrete. One stone alone could conceivably weigh 20 lb. Were the batch 10 lb underweight and one of these pieces of aggregate were added the batch would be 10 lb overweight.

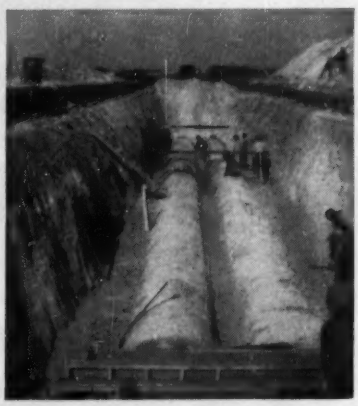
Although requirements are stiffening daily, precise measurement of each ingredient of concrete is neither economically desirable nor possible. Recognizing this, the Bureau of Reclamation and the U. S. Engineers Corps have worked out practical requirements for tolerances. It would be well if local governmental agencies would follow their lead, to eliminate specifications which are in part ridiculous and which simply cannot be met.

Many state highway departments

(Continued on page 105)

HOW TO HANDLE
WET JOBS

AIR BASE
DRAINAGE PROJECT
Charleston, S. C.
Contractor: C. Y. Thomason Co.



WELLPOINT ENGINEERS CUT
UNIT COST WAY DOWN

THIS JOB required the laying of 2 miles of 18 in. to 48 in. concrete-pipe storm-sewer in wet trench (depth ranged from 14 to 21 ft). Apart from ground water, the Griffin Wellpoint engineers also had to contend with a sub-soil of erratic nature, necessitating sand filters around most of the points.

• Who'd think such an operation could be rushed through at extremely low unit cost? Yet it was. Thousands of dollars were saved in the installation alone by the use of special slip-on hose-swing joints (showing in photo above.)

• Two wellpoint systems, with 2 different crews, kept working simultaneously, thus drying job "on the double." Was contractor pleased? So much so that both of the wellpoint systems are being permanently retained.

• For "quick-dry". . . specify . . . Griffin.

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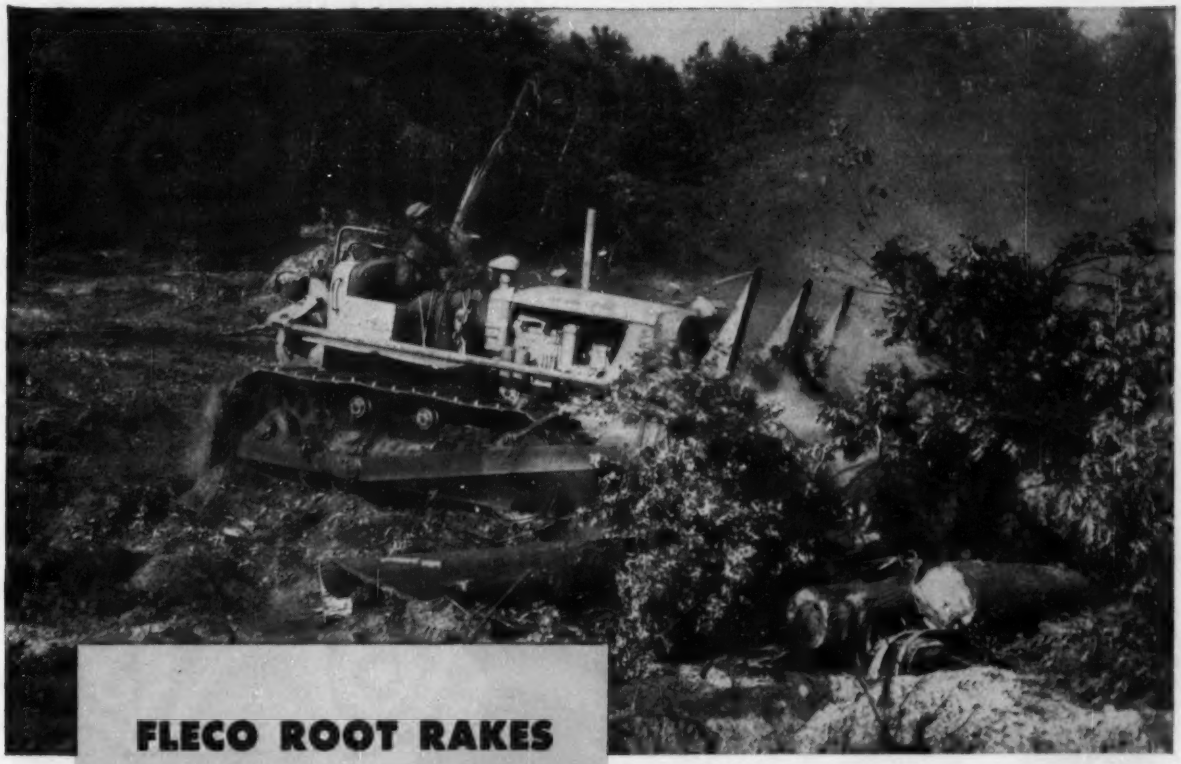

FLECO ROOT RAKES SPEED CLEARING OF OHIO "JUNGLE"

Correctly-curved teeth of this Fleco Root Rake give loads of brush, trees and roots a rolling action, requiring less tractive effort. Teeth may be spaced at any interval you desire. This Fleco 7S Root Rake, of Fred J. Schultz and Son, is equipped with top guards for added load capacity.

The 1100-acre site of the new City of Toledo Express Airport included 620 acres of matted vegetation that equalled any jungle growth. Stands of 6" to 18" timber were choked by tangled underbrush. This "jungle" had to be cleared.

Fred J. Schultz and Son, Toledo contractors, took the job. All trees, brush and roots were to be removed, piled and burned. The burning proved to be the most difficult part of the contract—until two Fleco Root Rakes, teamed with Cat D7 Tractors, took over the piling operations. Fleco Root Rakes are specialists in this work, having been designed specifically for just such tasks.

The Fleco Rakes took out surface roots, cleared the underbrush and piled the debris in one pass. Dirt was sifted out by the tough, heat-treated cast alloy steel teeth, leaving piles dirt-free for faster, easier burning. The Rakes easily handled 6" to 10" logs, stumps and small rocks and then moved on to other tough clearing projects.

The Schultz firm cleared five acres of the "jungle" each 9-hour day, earning great savings from the faster, easier piling and burning.

You, too, can save time and money with specialized Fleco land-clearing tools. Ask your Fleco-Caterpillar Dealer to recommend the Fleco equipment to speed your clearing work. There's no obligation, so call or write today!

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That's because each machine in the Bucyrus-Erie ⅜- to 4-cu. yd. line is designed from the ground up to handle its rated capacity most efficiently. There are no oversize or undersize dippers used to make "different" models. With Individual Design, speed, power, strength and weight are all properly proportioned, and the machine works most efficiently as a whole.

See your Bucyrus-Erie Distributor soon. He'll show you the other great advantages of Individual Design — fast work cycles, low maintenance, long machine life, low operating costs. 23E53

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INDIVIDUAL DESIGN . . . for each model in the line
⅜ to 4 cu. yd. gasoline, diesel, and single-motor electric Shovels, Draglines, Cranes, Clamshells, Dragshovels — Hydrocranes, Hydrohoes.

specify that batcher scales used on their work shall comply with the requirements of the American Road Builders' Association Bulletin 15, Section I, Part I, which is an excellent and exceedingly practical specification. This, however, refers to scale accuracy only and does not provide for any operational tolerances.

• **For scale tolerance** many specifications require compliance with the National Bureau of Standards' Handbook H-44, Federal Specifications AAA-S-121B, or ARBA Bulletin 15. The first two are highly technical, and their requirements are quite stringent. Briefly, H-44 provides for an acceptance tolerance of 1/10 of 1% and a maintenance of 2/10 of 1%, specification AAA-S-121B provides for acceptance and maintenance tolerance of 1/20 of 1% and 1/10 of 1%. These two specifications contain much that does not pertain to batcher scales. There are also certain modifications of the above tolerances not suitable for discussion here. The requirements for "large capacity scales" of these specifications apply to concrete batcher scales.

ARBA Bulletin 15 provides for a maintenance tolerance of 4/10 of 1%. This is a much more practical tolerance, especially when one considers the dirt and dust, temperature variations and variations in moisture so prevalent in concrete plant operations. Further, unless the plant is a ready-mix operation, it is generally a more-or-less temporary installation, an integral part of the construction industry, operated by construction personnel, and should not be looked upon in the same light as one would a permanent industrial application.

Bureau of Reclamation and U. S. Engineer jobs usually stipulate that the delivery of materials from the batching equipment shall be within the limits of accuracy as given in the table below.

Delivery Tolerances

Material	*Percent by Weight*
Cement	1
Water and/or Ice	1
Aggregate Smaller Than 1½ in.	2
Aggregate Larger Than 1½ in.	3
Admixture	3

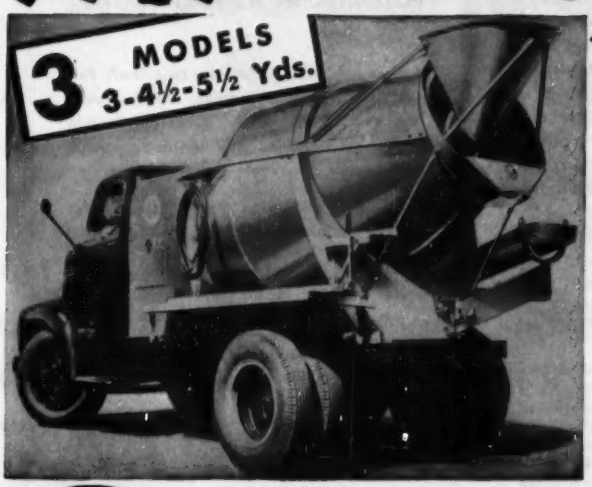
These two agencies are concerned with the delivery tolerances which, in reality, are the sum of the scale tolerances and the operational tolerances. They are quite practical because they set up the maximum variations in weight which will be allowed and acceptable. They show an interest in the results, not in some other theoretical consideration.

Another consideration in batching is the weight of material "in transit" between the fill gate and its final resting position in the weigh hopper. In manual operations the operator must allow for this. He must close the gate before exact final weight is reached. If he underestimates, he can crack the fill gate to allow a small amount of material to flow through.

In automatic operations the cut-offs must be set to take into account the weight of the material in transit, or some type of jog action of the fill valve must be provided which will dribble the material into the weigh hopper at a slow rate. In other cases, unless considerable time is allowed for the weighing operation, or unless elaborate and expensive slow-feed equipment is to be provided, a small error will be introduced in the weighing operation.

(Continued on page 108)

PAYS OFF WITH BIGGER PAYLOADS



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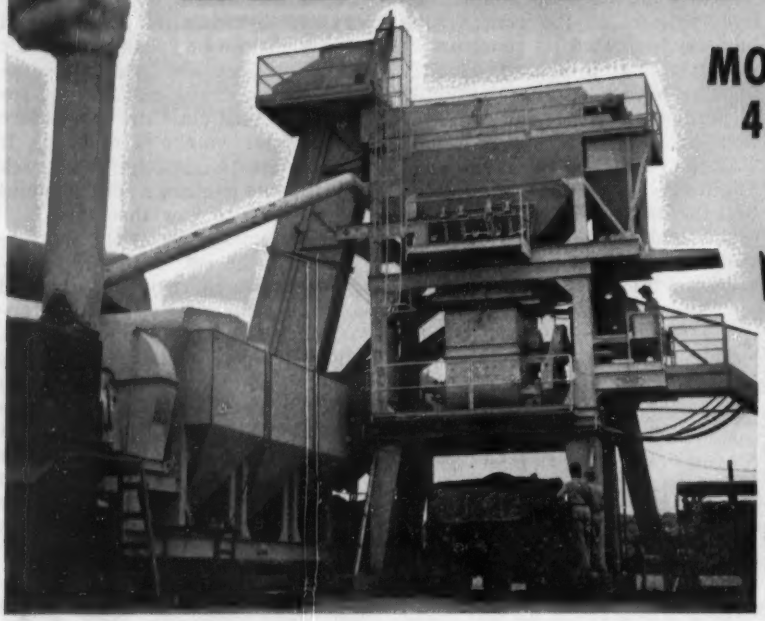
MC TRANSCRETE TRUCK MIXERS

MADSEN

MODEL 481



How do you figure the money-making potential of an ASPHALT PLANT?

When you look at an asphalt plant, look at it from the standpoint of how much it will earn for you this year, next year, as well as many years to come. Here are some things to consider: portability, first cost in relationship to production capacity, accessibility, and maintenance costs.

Take the MADSEN Model 481! It has more money-making features than can be found in any other plant of its type. It is designed for the ultimate in portability. The unitized sections are easy to erect and dismantle. Bin gates, weigh-box, mixer, and asphalt injection control valve are air-cylinder controlled. This means a faster mixing cycle resulting in greater daily production. The roll-away weigh-box means easy access to the mixer. Adequate service platforms, stairways and ladderways provide for more convenient and safer servicing. Think about these features . . . they are worth money to you. Consider them when figuring the money-making potential of your next asphalt plant.

Now is the time to learn about MADSEN! Let us tell you the complete story about the new MADSEN 481 4000-lb. Batch Capacity Asphalt Plant.

Let's Clean-up America's Highways
America's highways are beautiful. Don't make them a dumping ground for cans, bottles and rubbish.
MADSEN ASPHALT PLANTS

Photo at top of page shows the MADSEN Model 481 4000-lb. Batch Type Asphalt Plant in full operation. It is equipped with combination direct diesel drive and diesel electric drive, utilizing a Caterpillar 156 KW generating unit. Complete set-up includes a MADSEN 380 Dust Collector unit and a MADSEN 84" x 30' Dryer.

HERE ARE SOME FEATURES THAT MAKE THE MADSEN MODEL 481 YOUR BIG MONEY-MAKING POTENTIAL IN ASPHALT PLANTS

- **New MADSEN Model 440 Twin-Shaft Pug Mill Mixer (Patent Pending) with improved mixing action, faster discharge, built-in oversize capacity and precision-ground, externally removable sectional liners.**
- **Exclusive bin design (Patent Pending) for more uniform withdrawal of aggregates.**
- **MADSEN Pressure Injection System (Patent No. 1987243) . . . the asphalt is pumped into the mill in 5 to 7 seconds!**
- **Mixer operator station on end of plant away from fumes and heat.**

WRITE for your copy of Bulletin No. 800 describing the MADSEN Model 481

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Maximum capacity 5 cu. ft. 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

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Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

CONCRETE . . . Cont'd from p. 105

There is a need for a delivery tolerance even for such finely divided material as sand and cement. Neither sand nor cement are exactly free-flowing materials at all times, but are apt to "hang-up" and often pass through the filling control valve or equipment in surges.

Automatic Cut-Offs

In this article little attention has been paid to automatic scales. Fully automatic units, whether they be for multiple batchers or for a group of single material batchers involve electric circuits which can become quite complex. The heart of all systems is the cut-off mechanism. It may be a mercury switch or a small precision snap-action contact switch, either of which is actuated by the movement of one member of the lever system. Or it may be a photoelectric device actuated by the interruption of a light beam by the dial pointer.

The mercury switch and the precision contact switch do not require complex circuits, but when working in conjunction with various interlocks with which they are often associated, may require circuits which are not quite so simple. Photoelectric cut-offs, in addition to the same basic circuits required for the mercury and precision switch, also have need of amplifiers and relays.

Like other batcher equipment, all have their merits and demerits. Against the complexity of the photoelectric circuits must be considered the fact that some of the mercury switches splash, unless moved slowly, resulting in a faulty operation. The precision switches require a small force to make and break the circuit. This small force imposed upon the scale lever system is an error which must be included in scale tolerance.

The author is not enthusiastic about the use of photoelectric cut-offs for use with construction equipment, because experience seems to indicate that any equipment requiring vacuum tubes and amplification lacks the ruggedness and dependability which is one of the prime requisites of batching equipment.

• **For semi-automatic operation** of a batcher one cut-off only is required. In this type of operation the operator initiates the weighing up of the material either by pulling a lever or pressing a but-

(Continued on page 112)

AFTER ORDINARY METHODS FAILED . . .

Equipment being recovered after having been buried over a year.

Stang salvages buried construction equipment

In the spring floods of the midwest, valuable construction equipment was buried under many feet of sand and muck.

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Independent Suspension, an exclusive feature of the Johnson Elevator, allows the attachment to be moved by hydraulic controls on any plane, independently of the frame of the grader. The Johnson is designed for use with Austin-Western Power-Graders, and uses to advantage the Austin-Western superior operating features. Independent Suspension, combined with Austin-Western 4-wheel steering, provides the user with the world's greatest earth-moving team.

1. Independent Suspension allows movement of the Johnson Elevator on a horizontal, transverse, or vertical plane, or a combination of these planes, independently of the frame of the motorgrader.
2. Belt maintains a predetermined distance from the disc, preventing costly damage to the belt.
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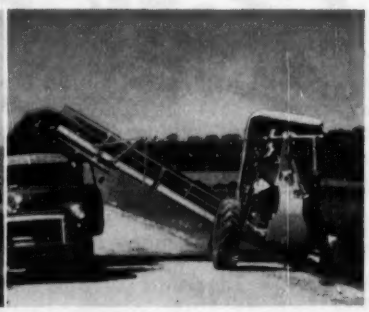
7. There is no side-draft because the rear wheel always runs directly behind the disc, regardless of the width of cut or slope of ground.
8. Exclusive Load Equalizer distributes the weight of the attachment more evenly over the wheels of the motorgrader.
9. Independent Suspension plus AUSTIN-WESTERN 4-wheel steering allows operation around curves and intersections, cutting the same width whether turning to the right or to the left.



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CONCRETE ... *Continued from page 108*

ton. Material flows into the weigh hopper until near final weight is reached, when the flow is cut off. It is cut off by the action of a mercury switch, a precision contact switch or a photoelectric cell cut-off which has been set sufficiently in advance to insure that there yet remains material to be added to the weigh hopper.

• **In full automatic operation** not one but two cut-offs must be provided. The first cut-off acts much as the cut-off for semi-automatic operation and is arranged to function slightly in advance of weigh-beam balance or final position of the dial pointer. To insure accurate weighing the fill valve must close at this time and final weight must be achieved either by jog action of the fill valve or by an auxiliary feeder which will feed material into the weigh hopper at a reduced rate.

This slow or dribble feed will continue until final weight is reached. The second cut-off must then function and completely cut off the dribble feed. Two mercury switches, precision switches or photoelectric cells will be required for full automatic operation.

• **In practically all cases** where fully automatic equipment is used provision is made for a third cut-off to provide an overweight lock. Strictly speaking, it is not a cut-off. However, it is always the same type of equipment as that required for the preliminary and final cut-off on an automatic scale. It is set so that it will be actuated should the weight in the weigh hopper exceed the tolerance allowed.

It is set up much like the preliminary cut-off in that it is not at the final weight cut-off point but is not far from that point. The overweight device is brought into action by the position of the scale beam or dial pointer when there is slightly too much material in the weigh hopper.

Batcher scales with cut-offs require that the plant owner employ personnel capable of servicing this type of equipment. If this is not possible, either his operating personnel must be able to replace immediately the cut-off device or the plant must be so located that a reliable electronic serviceman can be called on short notice.

Interlocks

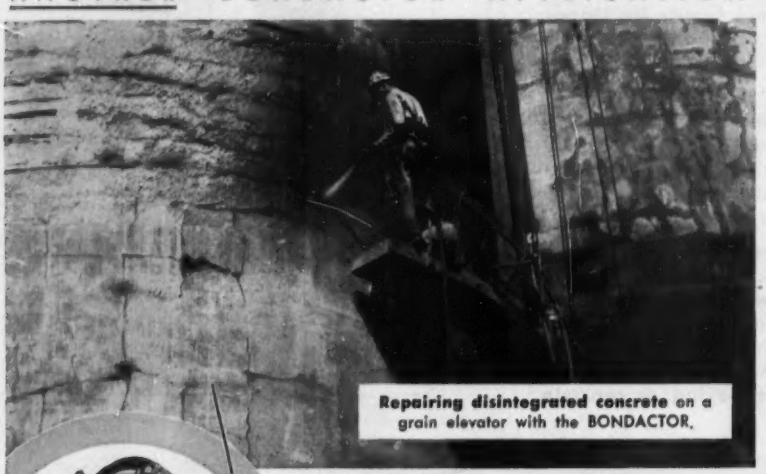
Full automatic plants, in addition to the cut-off devices mentioned above, will require various interlocks to guarantee against faulty operation. They generally consist of limit switches which are mounted on the fill valve or discharge gate together with several relays. The limit switches are rugged and dependable. They are not difficult to position, generally being actuated by the fill gate or discharge gate in its open or closed position. The circuits involved to impose these interlocks on the batcher operation are not quite so simple.

It is common to interlock the discharge gate so that it will not open during the filling operation or when the fill valve is not fully closed. Similarly, the fill valve can be readily interlocked with the discharge gate so that it will not open unless the discharge gate is fully closed. These are the two most important interlocks, and they should be on all fully automatic batchers.

An increasing amount of interest is developing in an interlock to prevent closing of the discharge gate of a weigh hopper until all of the material has passed out of

(Continued on page 114)

ANOTHER BONDACTOR APPLICATION



Repairing disintegrated concrete on a grain elevator with the BONDACTOR.

Make More Money on Concrete Repairs *with the* BONDACTOR

Make repair and restoration of disintegrated concrete one of your most profitable operations. With the BONDACTOR you can complete such jobs faster, easier and make more money than ever before. The BONDACTOR guns concrete and many prepared masonry and cementitious materials into the old surface so that perfect cohesion and a bonding action takes place. Bondacted repairs are generally stronger and longer-lasting than the original structure.

Whenever "gunned" concrete is needed, you can do it faster, cheaper with the BONDACTOR.

Other Profit-Making BONDACTOR Uses

Just a few of the new construction and repair jobs that the BONDACTOR does better: Concrete Wall and Roof Fabrication • Stuccoing • Waterproofing • Insulating • Fireproofing • Refractory Linings • Sandblasting.

3 BONDACTORS Available

Model 750 — Capacity: ½—¾ cu. yd. per hr. Operates with 75 or 105 CFM compressor.

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State intended use and materials to be gunned.

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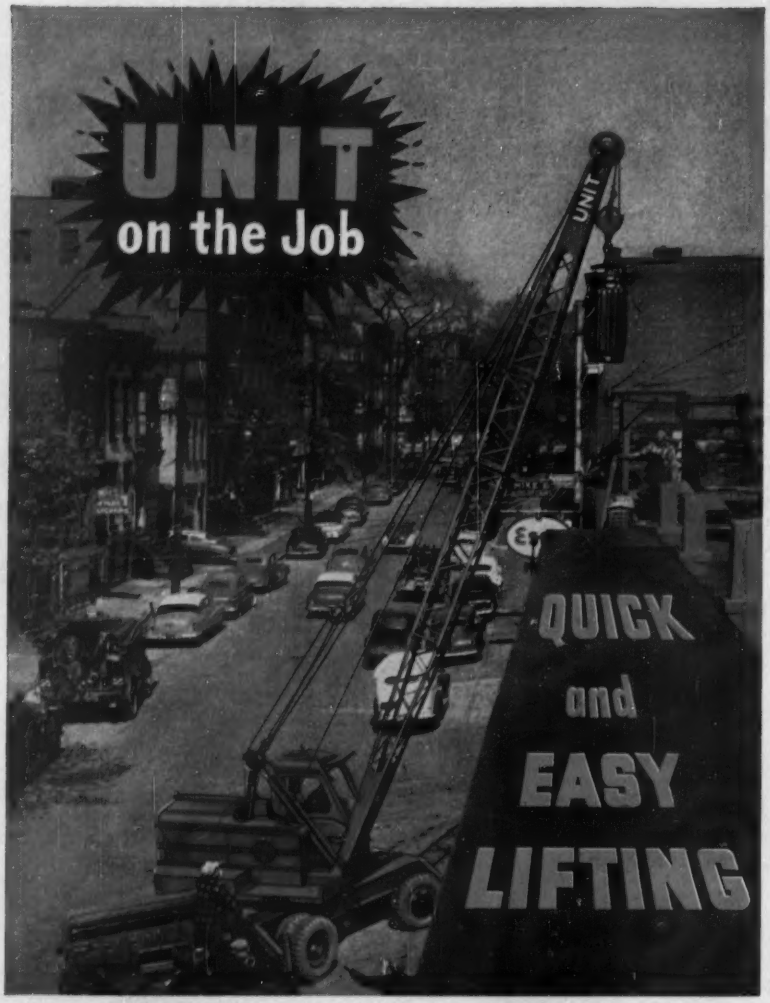

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UNIT

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

CONCRETE . . . Cont'd from p. 112

the hopper, as is indicated by the return of a dial pointer to zero or by the zero-balancing of a weigh-beam scale. This interlock increases the complexity of the circuitry considerably. However, it is deemed to be essential, especially on cement batchers, to guarantee that a full batch of cement will be in each and every batch. The overweight interlock also must be mentioned.

Scale Maintenance

To maintain properly a concrete batcher scale the operator should:

1. **Regularly inspect** all pivots and pivot seats. They may be kept clean and in good working order by wiping with a dry cloth. The use of oil or grease at these points is not recommended because this will increase the tendency of cement dust to cling to these surfaces.

2. **Check regularly** for rubbing of one element against another, such as shackle against beam. Make certain that the pivots are always firmly seated.

3. **Keep the dash pots clean.** Check regularly to eliminate any friction due to rubbing of dash pot piston against cylinder wall or rod against cover.

4. **Check ratio** and accuracy of scale by use of test weights.

5. **Keep scales clean as possible**—the entire mechanism. A rigorous program to accomplish this should be maintained.

Concrete batcher scales, while having a high degree of accuracy, are relatively rugged. Practically all parts are clearly visible and generally accessible. Proper maintenance is neither difficult nor does it involve an excessive amount of time. The dial units, on the other hand, are more intricate and delicate. Any extensive cleaning or adjustment should be left to a man qualified by experience to do this type of work.

* * *

The fifth article of this series will appear in the February issue.

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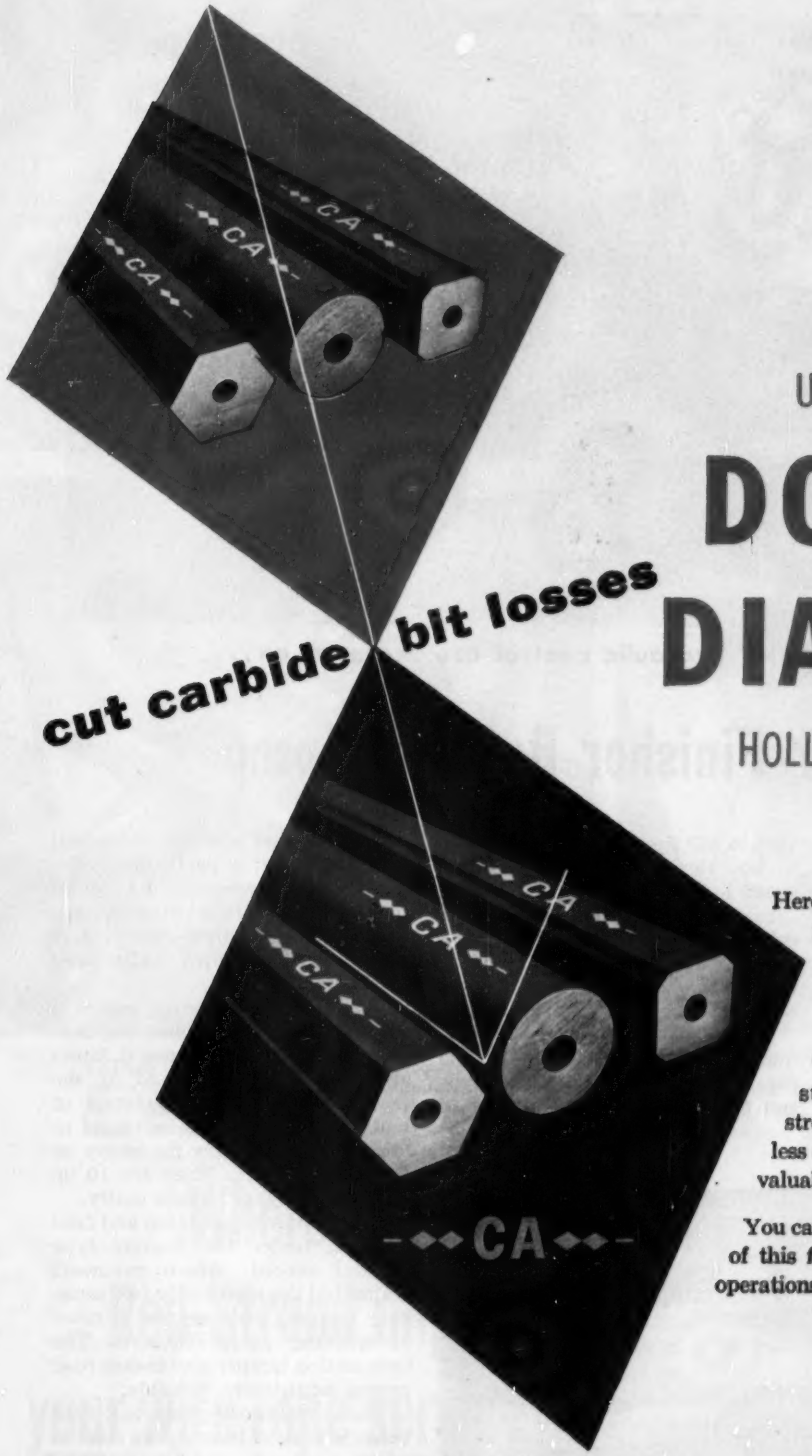

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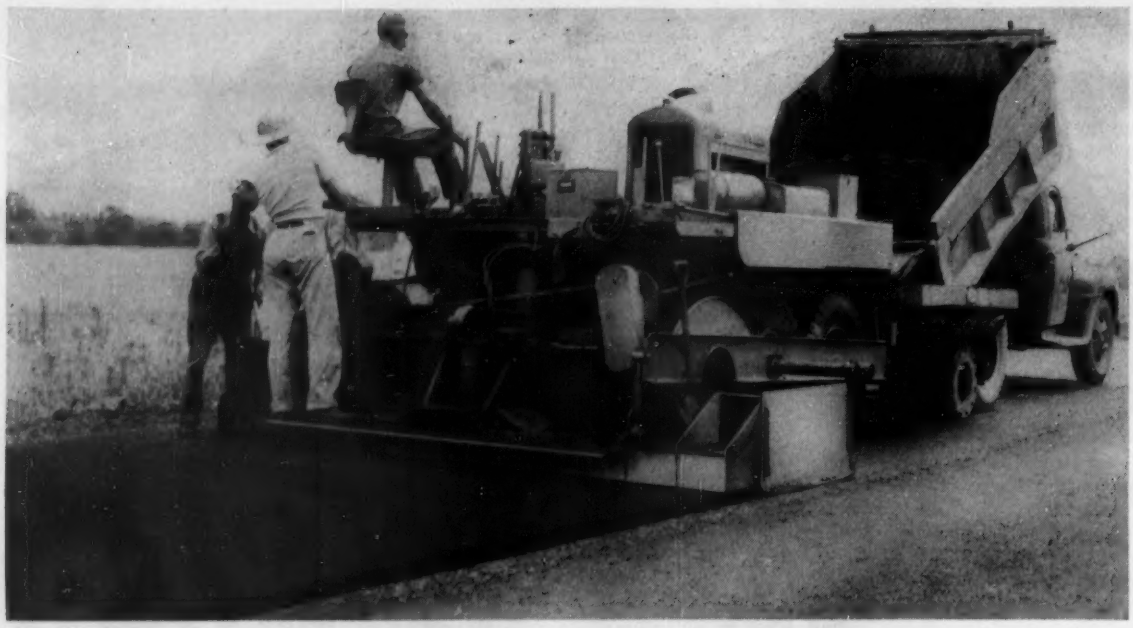


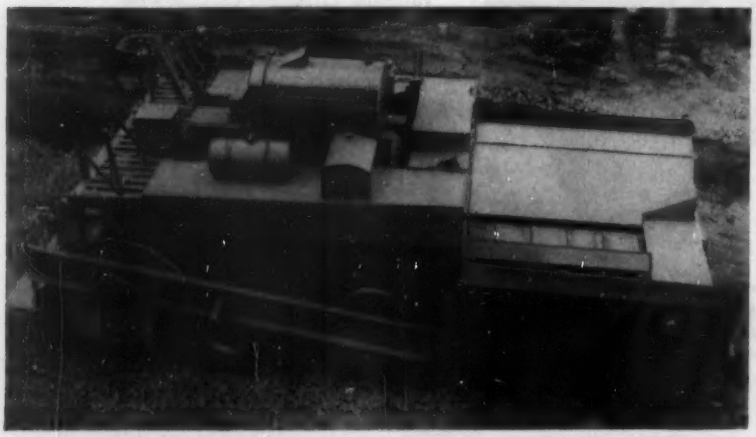
Floating screed, long wheelbase, hydraulic control are featured on...

Big Paver-Finisher Built by Apsco

A FLOATING SCREED, long wheelbase and close control of flow and placing of material mark the design of the new Apsco Model PF-90 bituminous paver-finisher.

The PF-90 is rubber mounted and self-propelled—pushing dump trucks ahead as they unload into its 4-yd hopper. A five-speed transmission makes possible numerous working speeds ranging from as low as 18 fpm at 1,200 rpm to 360 fpm at 1,800 rpm of the 68-hp Hercules engine. Travel speed is 5¼ mph at 1,800 rpm. It spreads, levels and tamps hot or cold bituminous mix and has been used in paving with pugmill-mixed lean concrete. No road forms are required for any of these materials.

Dual drag-type conveyors pull material from the receiving to the spreading hopper. Each conveyor can be operated independently to provide flow of material as needed on either side; a particularly desirable feature when paving around banked curves. In addition, an operator-regulated flow-control gate above each conveyor helps feed materials evenly.



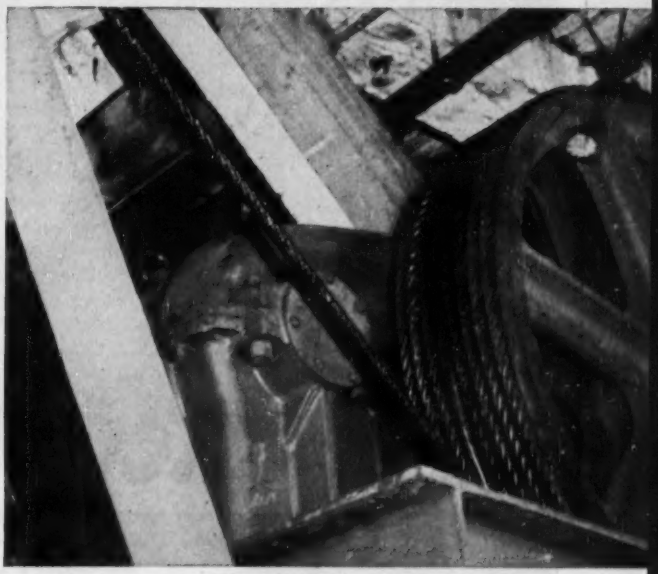
LARGE TANDEM DRIVE WHEELS and front solid rubber tires make for fast transport. Controls are grouped in front of operator, who can work from either side. Note 4-yd material hopper.

Two chain-driven cross augers in the rear hopper receive the mix from the conveyors, move it laterally for spreading ahead of the screed and prevent separation of materials. Augers can be raised or lowered as necessary for heavy or light road layers. They are 10 in. in dia and flights replace easily.

Two tamping bars tamp and feed material under the floating type leveling screed. Apsco engineers claim that the use of only two separate tampers reduces the number of working parts required. The two-section tamper also makes road crown adjustment possible.

The screed is one-piece, box-type construction, of heavy gage steel to prevent warping and buckling and has an extra hard wearing surface. Desired crown can be obtained simply by setting the crown adjustment screws on top center. Excess crown in existing pavement can be taken out by using these independent adjustments. The screed is heated by a blower-type

(Continued on page 118)



EXTRA FLEXIBILITY—Wire rope encounters fast sheave action, reverse bending, constant stop-and-start operation on many jobs. When this same rope must also lift or pull heavy loads, an unusually flexible, strong wire rope is needed.

Rope jobs like paver skip hoists, overhead cranes, large shovel and dragline hoists, and sawmill carriages demand these qualities. That's where the use of 6 x 37 Red-Strand wire rope saves time and money.

Where will 6x37 Red-Strand improve your wire rope service?

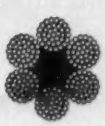
Look at a cross section of 6 x 37 wire rope. You see three rings of small, uniformly sized wires in each strand. This differs from a rope construction like 6 x 19, which contains fewer and larger wires.

The *smaller size* wires make 6 x 37 more *flexible*. The *larger number* of wires maintains rope *strength*.

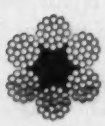
Would this combination improve your wire rope service? Would it solve a problem for you? Leschen's higher-than-rated quality is also providing longer-than-expected service to heavy industry everywhere.

Check with your Leschen man. He can help you.

Leschen's 64-page Wire Rope Handbook tells you all about 6 x 37 and other Red-Strand wire rope constructions. Ask or send for your free copy.



6 x 37



6 x 19

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

LESCHEN
HERCULES Red-Strand
WIRE ROPE

DUAL DRAG-TYPE CONVEYORS pull bituminous mix out of 4-yd hopper to augers ahead of screed. Conveyors operate independently to control feed across full width of paver.

pressure-gun oil heater. It starts at the push of a button and operates electrically.

Depth control functions through the angle setting of the floating screed which is connected through a supporting side channel to a pivot point ahead of the drive wheels on each side. Raising or lowering the adjusting screw on each side changes the angle of the screed which controls, in turn, the amount and depth of material being laid. The paver will lay courses up to a depth of 10 in.

Long wheelbase is designed to help the paver-finisher put a smoother finished surface over old pavements with numerous irregularities. By teaming up a long wheelbase and floating screed, Apsco engineers feel they have the answer for those "tough-to-resurface" pavements and that the Model PF-90 will level even the longer stretches of uneven pavement in only one pass.

Standard width range is from 8 to 13 ft and width is increased in 15 min in a three-step operation:

1. Slide out ends of hopper;
2. Insert auger extensions into recessed end of existing auger;
3. Insert and secure tapered ends of screed and tamper extensions into socket couplings of screed and tamping bars.

Machine control is chiefly through hydraulic adjustments convenient to the operator's seat and through separate clutches for conveyors and augers. Dual controls make it possible for the operator to run the paver from either side merely by transferring his seat.

The Apsco PF-90 is 19 ft long, 6 ft 8 in. high, 8 ft 2 in. wide when

(Continued on page 121)

Parmanco

Latest in design . . . HI-SPEED

HORIZONTAL DRILL

Drills a 6-inch hole in two-thirds the ordinary time

Completely re-designed around a 40 h.p. engine

NOTE: Auger rack a Parmanco feature which saves on drilling time. Augers always handy on machine as it is moved from hole to hole. Four individually adjustable leveling jacks for faster set up and smoother drilling.

The HI-SPEED DRILL is designed for drilling 5-6-8 inch holes to 100 feet or more. The 40 h.p. engine with four drilling speeds makes possible the reduction of footage time by one third. This new drill, the very latest in design, is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling. *Send for Complete Details.*

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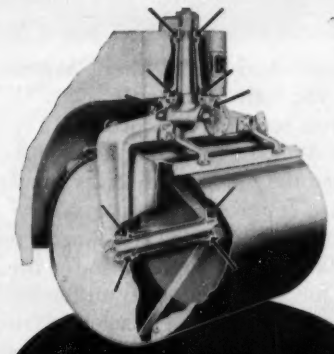
The only roller that can give "factory new" guide roll performance for the life of the machine . . .

8-12 TON
10-14 TON TANDEM ROLLERS

You will find Huber Tandem rollers on blacktop jobs throughout the world. Adjustable swivel pin and king pin roller bearings assure smooth finishing.



Adjustable tapered roller bearings for swivel pin, king pin and roll axle.

Only Huber Tandem Rollers can give you "factory new" guide roll performance for the life of the machine. The reason: only Huber has adjustable tapered roller bearings on both ends of the long swivel pin, as well as on the king pin and the roll axle.

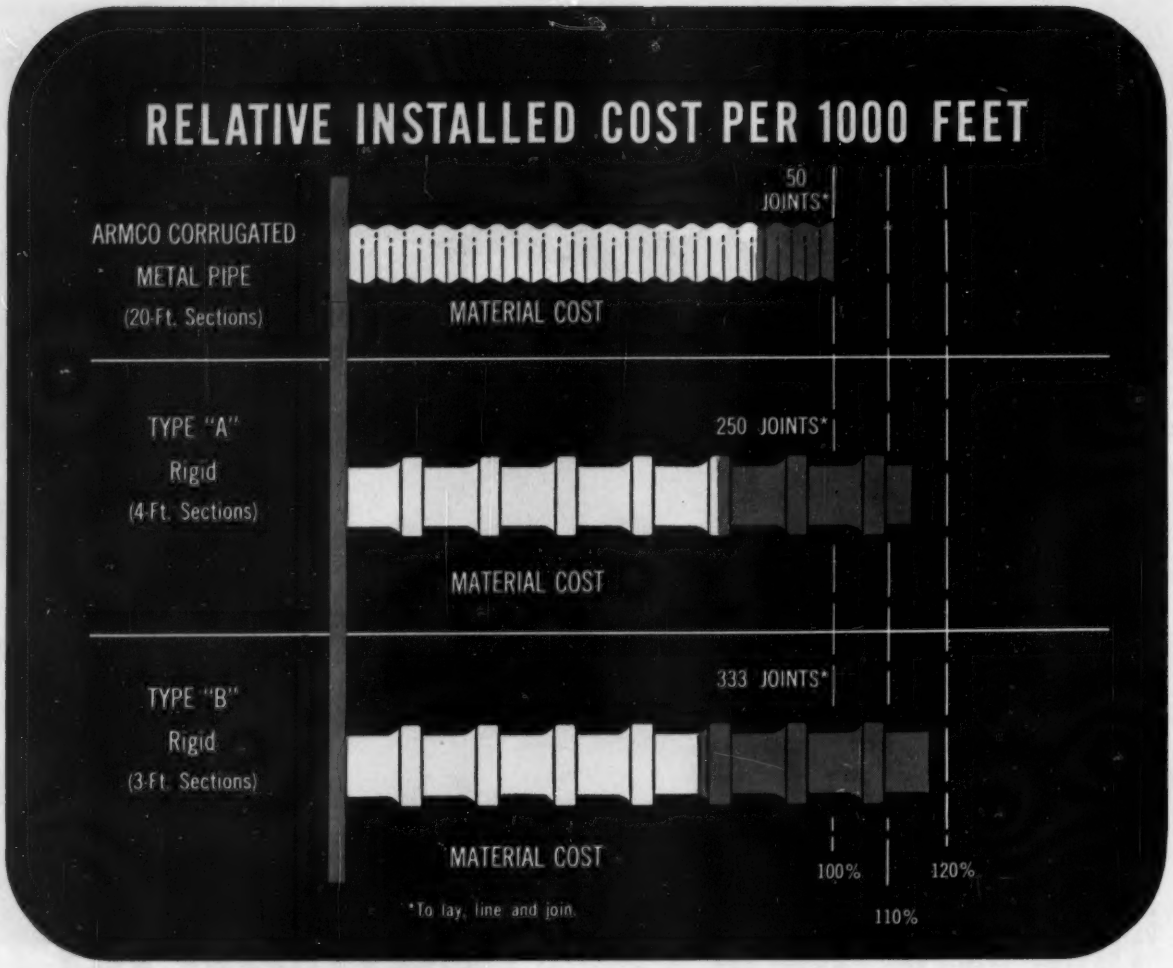
Simple adjustments in the field keep the entire guide roll assembly "factory new" in performance. There is no looseness, no wobble to cause scuffing.

The full story of these and other features of the Huber 8-12 ton and 10-14 ton tandem rollers are described fully in Bulletin T-152. Write for a copy or see your nearest Huber representative.

HUBER MANUFACTURING COMPANY
MARION, OHIO, U.S.A. — Since 1863

HUBER

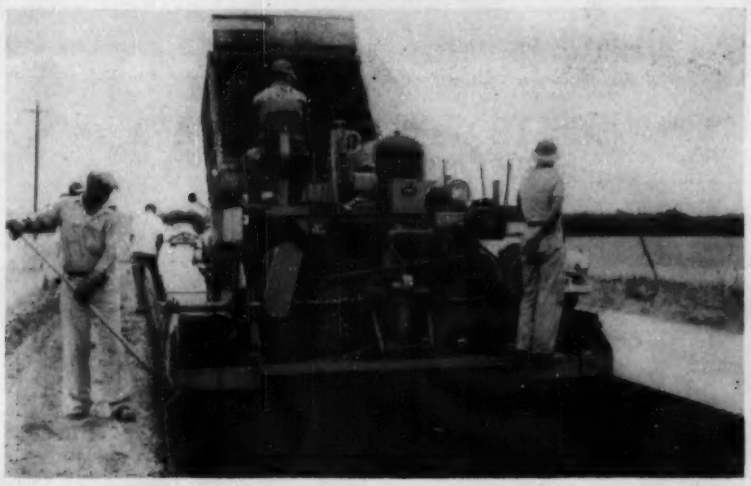
MANUFACTURERS OF HUBER MAINTAINERS, GRADERS AND COMPLETE LINE OF ROLLERS



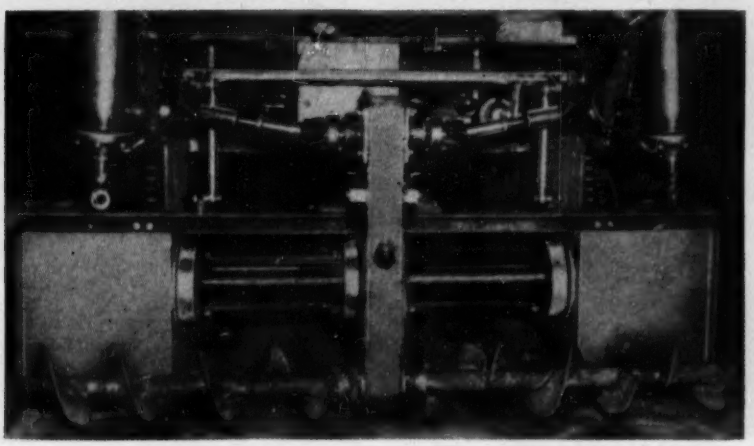
How do YOU figure drainage jobs?

It's the *installed* cost that counts! And that is where Armco Corrugated Metal Pipe saves you time and money. It permits lower bids while you retain ample profit. Here's why. Long sections of Armco Pipe, compared to short-section rigid pipe, reduce the number of joints required by 80 per cent or more. There are fewer sections to lay, line and join with no delay for curing. Handling is easier. And thanks to the strength of corrugated metal, there is less chance for breakage. No wonder you can speed the job and save money in the bargain. Armco Corrugated Metal Pipe is supplied in diameters from 8 to 96 inches. Lengths range up to 24 feet. Bituminous coatings or ASBESTOS-BONDED Pipe protect against severe corrosion. Write for illustrated catalog. Armco Drainage & Metal Products, Inc., 1454 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

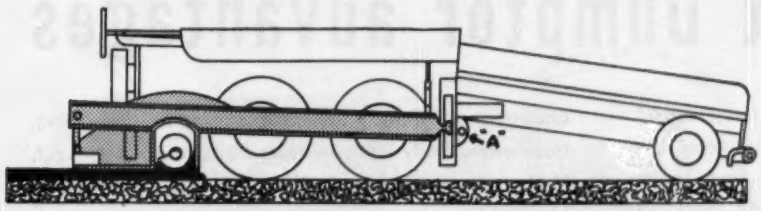
ARMCO DRAINAGE STRUCTURES ARMCO



SIDE EXTENSIONS permit width increases from 8 to 13 ft, leave same smooth finished surface. Oil-burner-heated screed is rugged box-type construction, adjusts for road crown.



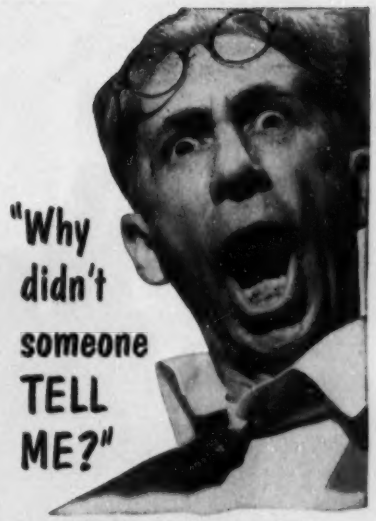
TWO AUGERS MOVE MATERIAL horizontally, work separately to control flow on each side. Hydraulic adjustment keeps flights in best position to prevent material separation.



FLOATING SCREED PIVOTS ahead of drive wheels, is raised or lowered at point A to maintain depth of paving course. Apsco thus gets control over surface irregularities.

side extensions are removed for over-the-road transport. Weight approximates 20,000 lb. Tandem drive wheels in the rear use 10:00x20, 12-ply tires; front wheels have 24-in. solid rubber tires, 12 in. wide. Steering is hydraulic with an assist possible through independent braking of each side on the rear drive wheels. Timken bearings are used throughout. Rollers across the front frame contact the rear tires of material supply trucks, pushing them ahead as the paver advances.

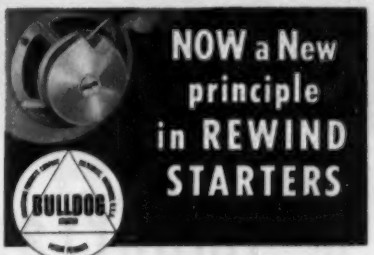
The Model PF-90 paver finisher is the newest product of the All Purpose Spreader Co., Elyria, Ohio. A continuing objective on Apsco products is standardization of parts wherever possible. Some of the parts used on the new paver fit the Apsco base paver and road widener. This is welcome news. That kind of heads-up engineering is appreciated by every contractor.



"What's the idea of secrets? Why didn't someone tell me these high repair charges on Welding Equipment are unnecessary? Why didn't someone say that Smith's have *Lifelong Guaranteed* Torches that don't cost anything to repair! That's what we need around here!"

Mail us a card today.

SMITH WELDING EQUIPMENT CORPORATION
Dept. CME-62, 2635 S.E. 4th St., Minneapolis, Minn.



This amazing new Armstrong Starter is packed with important new features — It is 50% lighter — smoother acting — easier to service and mount.
The principle is based on the use of friction inside a conventional rope starter cup. Actuated by a cam principle it engages after ¼ inch pull. Eliminates danger of teeth or pawls breaking — permits greater tolerances in mounting. Available with stationary or rotating screen. Competitively priced.

ARMSTRONG BULLDOG STARTER
HERE'S HOW IT WORKS

1. Cam actuated teeth extend to grip inside of standard rope pulley cup.
2. Spring loading retracts teeth when pull stops.
3. Rope pulley available for hand starting in case of emergency.

If you make, sell or use products like Chain Saws • Pumps • Power Mowers • Outboard Motors, you can reduce weight — improve starting — increase starter life.

4. Heart of unit can be incorporated in end products design.

ARMSTRONG PRODUCTS CO.
Milwaukee, Wis.

7 important Dumptor advantages

Take another look at the latest model Koehring 6-yard Dumptor shown here. It has some important features worth checking. Notice how heavy snubber-spring on steering axle cushions road shocks — yet retains Dumptor's unique advantage of no spring maintenance. There are no leaf springs. Big shock-absorbing drive tires eliminate need for springs on the drive axle.

Alignment of drive wheels with steering wheels adds to efficiency of Dumptor no-turn shuttle hauling — makes a big difference in traction and flotation when Dumptor is shuttling back and forth across loose stockpiles, soft ground.

Another basic Dumptor advantage is instant gravity dump. It's controlled by a simple body latch and new dump lever arrangement. Gravity dumping eliminates slow-acting, troublesome body hoists — never balks, never wears out. Notice, too, the new streamlined, all-steel body. Even with all this heavy-duty strength, Dumptor still has more than 6 h.p. for every ton of loaded weight. It accelerates fast, pulls through soft ground and up grades with less shifting — climbs 24% grades fully loaded.

Let your Koehring Distributor give you all the latest Dumptor® facts. See him soon, or write.

KOEHRING COMPANY

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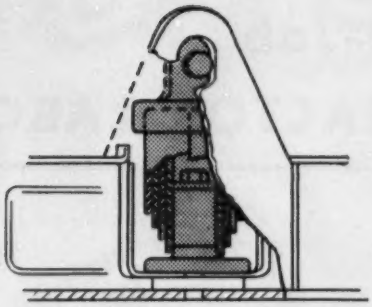
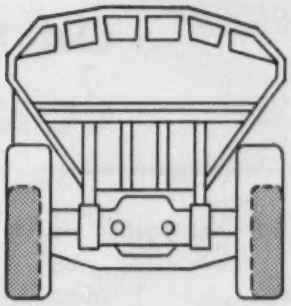
K437



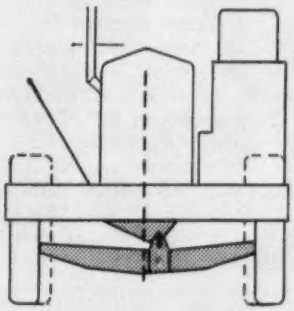
Smooth ride

Heavy, snubber-type spring is mounted between Dumptor main frame and the steering axle. Shock-absorbing action provides plenty of "cushion" — takes all the jolts out of rough, off-road travel. Easy on operator and machine.



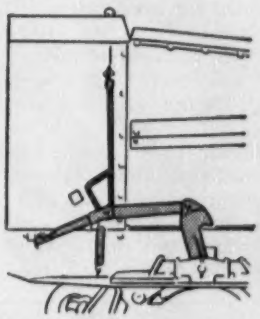
Tires track in direct line

Wider, heavier steering axle puts Dumptor steering wheels in direct line with big drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, and on rough haul roads.



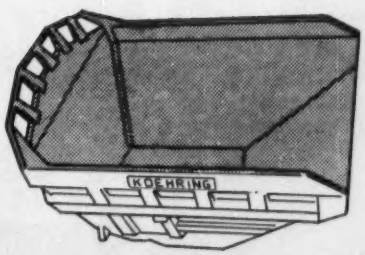
Off-set pivot on axle

Pivot point on steering axle is off-set from center line 3¼" toward operator side of machine. There's no sag, even with unbalanced load. Steering axle oscillates up to 21" — keeps twisting strains out of Dumptor main frame.



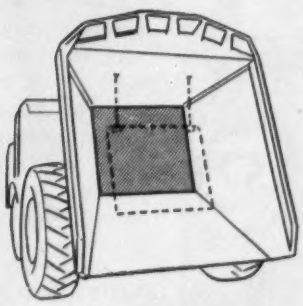
New body-latch, dump lever

Body latch for 1-second gravity dumping is simple, trouble-free. Latch is engaged by a single hook, mounted on the chassis frame. Dump lever is located inside the cab, in an easy-reach position to left of operator.



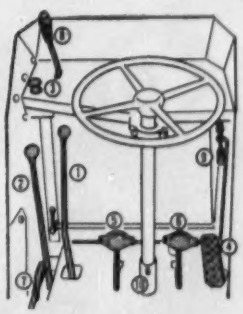
Streamlined, all-steel body

Inside is free of bulges or ledges. Top edge is box-beam constructed. Sides, ends are ribbed with 5 and 8" channels. Double-plate bottom is lined with multiple steel beams. Note ridge bar added to sturdy rock-guard teeth.



Bolted or free-swinging pan

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has free swinging kick-out action — breaks suction when dumping wet or sticky materials.



Easy-reach controls:

(1) Speed gear shift lever, (2) directional gear shift lever, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body-release lever, (9) hand throttle, (10) running lights control switch.

On-the-Job
CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

The Changing NLRB

WITH TWO Eisenhower appointees on the National Labor Relations Board, changes are quietly taking place in basic Board policies. Guy Farmer, the 41-yr-old chairman (CM&E Aug., p. 85) indicated as much in a recent speech. The Board would strive to be impartial, he said, and would carefully review existing Board policies and precedents. It would not be held in a strait jacket by previous decisions establishing basic policy.

Changes already are being evolved through decisions reversing previous policies and in statements setting forth new procedures. Thus, for example, it is no longer an unfair labor practice for an employer to question employees about their opinion of unions or how they will vote at a forthcoming representation election. Heretofore, the Board had held that the mere questioning was sufficient grounds for holding the employer guilty of an unfair labor practice. The Board now says that the questioning is not automatically an unfair labor practice; there must be a showing of discrimination against, or coercion of, the employees before the employer is found guilty.

In another case, the Board ruled that part-time guards or watchmen must be excluded from the bargaining unit of other employees. The Board had held since 1948 that such men who spent less than half their time on guard duty could be included in the bargaining unit with other employees. Now the Board says No, regardless of the amount of time spent on guard duty, so long as this duty is part of his regular employment. Could this change of policy affect contractors? Yes, when members of the building trades unions act as guards or watchmen at night and work on the construction job as laborers or mechanics during the day. The Taft-Hartley Act says that anyone employed as a guard shall not be included in a bargaining unit with other employees. The Act does not specify the amount of time the individual must spend as a guard. This decision indicates the course that the Board will follow in the future. To avoid trouble you can hire retired policemen as guards or watchmen and not use men from the same unions that furnish laborers and mechanics to the job.

You also will be affected by changes that the new chairman would like to see develop in Board jurisdiction policy. In his opinion, the Board has gone too far in assuming jurisdiction over labor disputes in businesses essentially local in character. As he said recently, "Uncle Sam's long arm has reached out to assert itself over too many

(Continued on page 128)

All Galion Allsteel dump bodies are now made of high tensile steel — up to 25% lighter and stronger than ordinary dump body steel.

FOR HYDRAULIC HOISTS AND DUMP BODIES, THE BUY WORD IS GALION

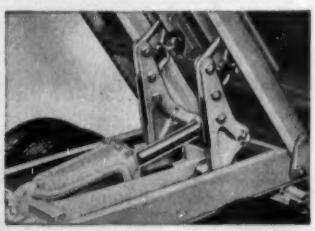
GALION MODEL 880 heavy duty hydraulic hoist and Model 12 contractors body easily handle 10½ to 15½ ton loads.

If you want built-in ruggedness, *extra* lifting and *extra* carrying capacity . . . always specify Galion! Galion hydraulic hoists and dump bodies work longer with less maintenance and lower operating costs. With Galion, jobs begin on time, continue steadily without interruption . . . end on schedule.

For big jobs (or for little ones), Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet every construction need. And . . . if you need extra heavy duty or special units to fill unusual requirements, Galion will be glad to design and build them for you.

A-1202

GALION MODEL 700 hydraulic hoist with steel subframe, ideal for loads of 6½ to 8½ tons.



JUST SEE YOUR NEAREST GALION DISTRIBUTOR— TODAY!

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

SUPERIOR

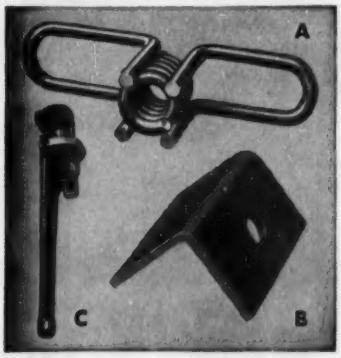
CONTINUOUS THREADED COIL RODS . . . . . MAKES DIFFICULT TYING JOBS *Easy* . . . . .

Superior Continuous Threaded Coil Rods, with or without Coil Wing Nuts and Corner Brackets, are a valuable supplement to Superior Coil Ties and standard working parts when job conditions are unusual or difficult.

In three typical applications, shown at the right, these Continuous Threaded Rods are used; (1) to tie form corners; (2) as an anchor rod tie down and as coil bolts; and (3) as a coupling for two coil ties providing an adjustable form tie.

Available in ½", ¾", and 1" diameters and in any length up to 10 ft., Superior Continuous Threaded Coil Rods in quantities can be cut to length on the job with a heavy-duty hand Coil Rod Cutter.

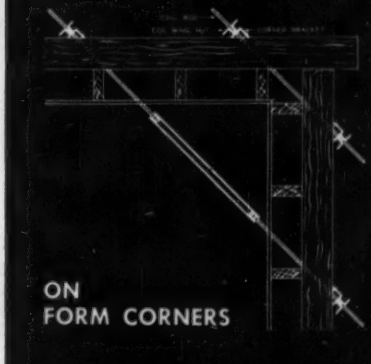
Superior Continuous Threaded Coil Rods are the answer to unusual or difficult tying problems. When you use Superior you are assured of the *best* in design, material, and workmanship.



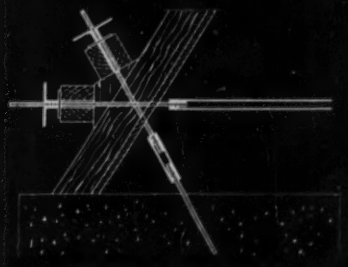
A-COIL WING NUTS
Coarse helix coils form the threads. Easily applied and removed from rod. Develops maximum capacity of rods.

B-CORNER BRACKET
An *exclusive* Superior feature. Provides simple, efficient method of tying form corners and bulkheads.

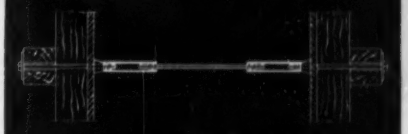
C-SPECIAL COIL ROD WRENCH
Heavy-duty Stillson type wrench with special jaws for gripping and turning Coil Rods with least damage to threads.



ON FORM CORNERS



FOR ANCHORAGE



AS AN INTERNAL TIE
Two Coil Ties and a length of Coil Rod make an adjustable form tie and spreader.

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office: 1775 Broadway, New York 19, N.Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

NOW AVAILABLE . . . LATEST EDITION OF CATALOG 500. Contains a valuable table for spacing studs, wales, and form ties. REQUEST A COPY TODAY.

When nature's against you...

that Pioneer Edge

C. R. PILCHER
GEN. SUPERINTENDENT
UNION CONSTRUCTION CO.

Paul Bunyan OF CRUSHERMEN

● Up in Montana, C. R. Pilcher and his Pioneer 46VE Plant are fast becoming a legend.

Take portability, for instance. Pilcher can move his plant to a new location, set up, and be in full production in 2 shifts . . . if it's within 10 miles of the original site.

They tell how last year, when floods hit Montana, Pilcher and his plant were almost continually on the move. During the emergency they produced 20,000 tons of material from 7 different pits. Once they completed a move, set up, and were crushing within 11 hours.

They've set some fabulous non-stop production records, too. On a heavy crushing job at Polson, Montana, they lost only 1½ hours operating time on a 30,000 ton job with ¾" material at an average rate of 125 tph. On an 18,000 cubic yard job, they averaged 123 yards per hour on ¾" crushing and 156 yards on 1" minus. Fantastic? Not at all. Simply the case of a skilled operator who knows how to take advantage of Pioneer's *extra* capacity and *extra* stamina . . . in other words, the PIONEER EDGE.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

is on your side

Pioneer plant overcomes obstacles on mountain job

IT'S rugged country up in the Bitteroot Mountain wilderness where Diamond Match Company decided to build its road. Short summers limit the construction season . . . mean bears make it hard to keep camp cooks . . . and rock is so hard and abrasive that even tungsten carbide bits often wear out in less than 80′ of drilling, (they're usually good for 500′ or more). It's he-man country and calls for "he-man" equipment.

That's why Union Construction Company, of Missoula brought in its PIONEER 46VE plant to produce the material needed for surfacing the new road Diamond Match had pushed from Superior, Montana, 20 miles up Trout Creek Canyon to the Idaho state line.

U.S. Forest Service specifications called for 15,000 tons of ¾″ minus, 32,000 tons of 1″ minus, and 30,000 tons 1½″ minus material. And extreme hardness wasn't the only problem; the rugged terrain called for unusual portability, and the short season demanded high crushing capacity with minimum down time.

But once again, the PIONEER EDGE paid off. With virtually 100% crushing, Union's plant turned out as much as 150 tph of ¾″ material, while a sub-contractor, Glenn Geery, of Missoula, also produced high tonnage with an older PIONEER plant.

The job was completed on time. Another triumph marked up for PIONEER equipment.

THE **Edge** THAT COUNTS

Few crushing plants will ever have to tackle an assignment as difficult as the one described above, which at the time of writing, had crushed well over 500,000 tons of material. But whether the job is tough or easy, the contractor who has the PIONEER EDGE on his side knows he can count on greater output with less upkeep . . . important items where the bidding is close.

PIONEER ENGINEERING WORKS, INC.
1515 Central Avenue • Minneapolis 13, Minnesota
(SUBSIDIARY OF POOR & COMPANY • CHICAGO)

• Please send me information on the equipment checked.

☐ JAW CRUSHERS	☐ GRAVEL PLANTS	☐ APRON FEEDERS
☐ ROLL CRUSHERS	☐ WASHING PLANTS	☐ MECHANICAL FEEDERS
☐ ROCK PLANTS	☐ BITUMINOUS PLANTS	☐ VIBRATING SCREENS
☐ ORO FEEDERS	☐ BITUMINOUS PAVERS	☐ CONTINUFLO CONVEYORS

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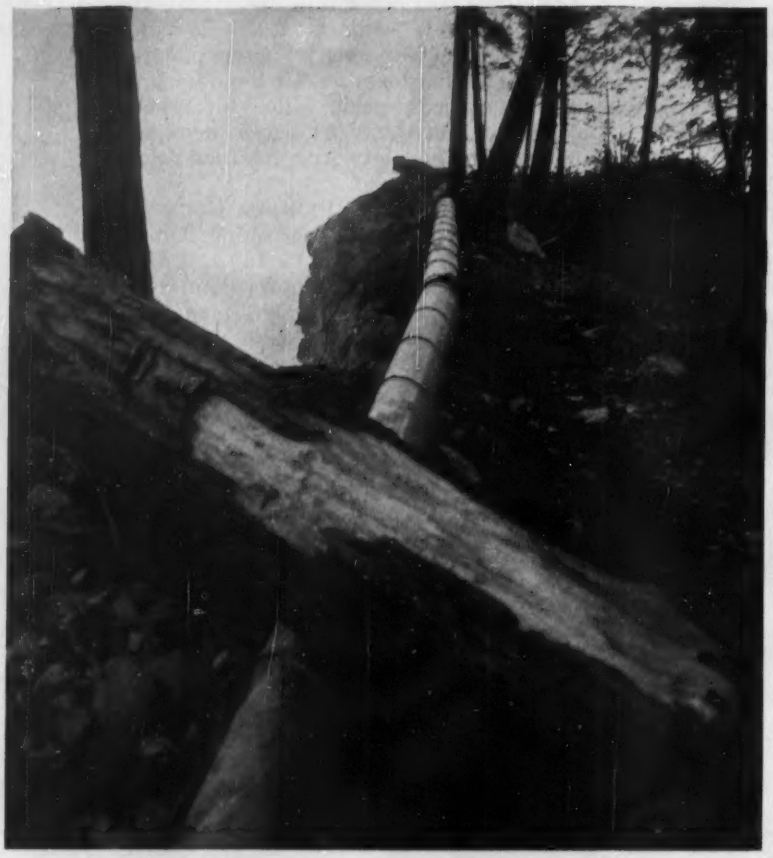
Company_____

Address_____

City_____ Zone____ State_____

THE SHOW MUST GO ON



In the theatre of construction, Naylor light-weight pipe is constantly proving its performance ability. Take this scene from the building of the New York Thruway showing a line of 8-inch Naylor pipe feeding air to rock drills. Despite the constant battering from flying rock and the terrific impact of a fallen tree, there's no interruption in the lines and the show goes on. If this is the kind of performance you need for your jobs, write for Bulletin No. 507 and get the complete story.

NAYLOR PIPE

Naylor Pipe Company • 1268 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

LABOR . . . Continued from page 124

labor - management situations which ought to be resolved closer to their "origin." He is for letting the states settle such disputes.

Last month precedent was set when the Board refused to assert jurisdiction over a case involving a rural electric company, finding that its business is essentially intra-state as it deals "almost exclusively" with local consumers. In his dissent, board member Abe Murdock stated that for the last 3 yr it has been Board policy to assert jurisdiction over all cases involving public utility systems such as gas and electric because of the important impact on commerce. There was, he pointed out, a direct inflow of materials from out of the state amounting to more than $150,000, which alone was sufficient grounds to take jurisdiction.

This is a definite departure from previous policy, apart from the fact that the employer is a public utility. One test that always had been applied by the Board as to whether an employer was engaged in interstate commerce had been the purchase or sale of materials in other states. Its yardstick was $25,000.

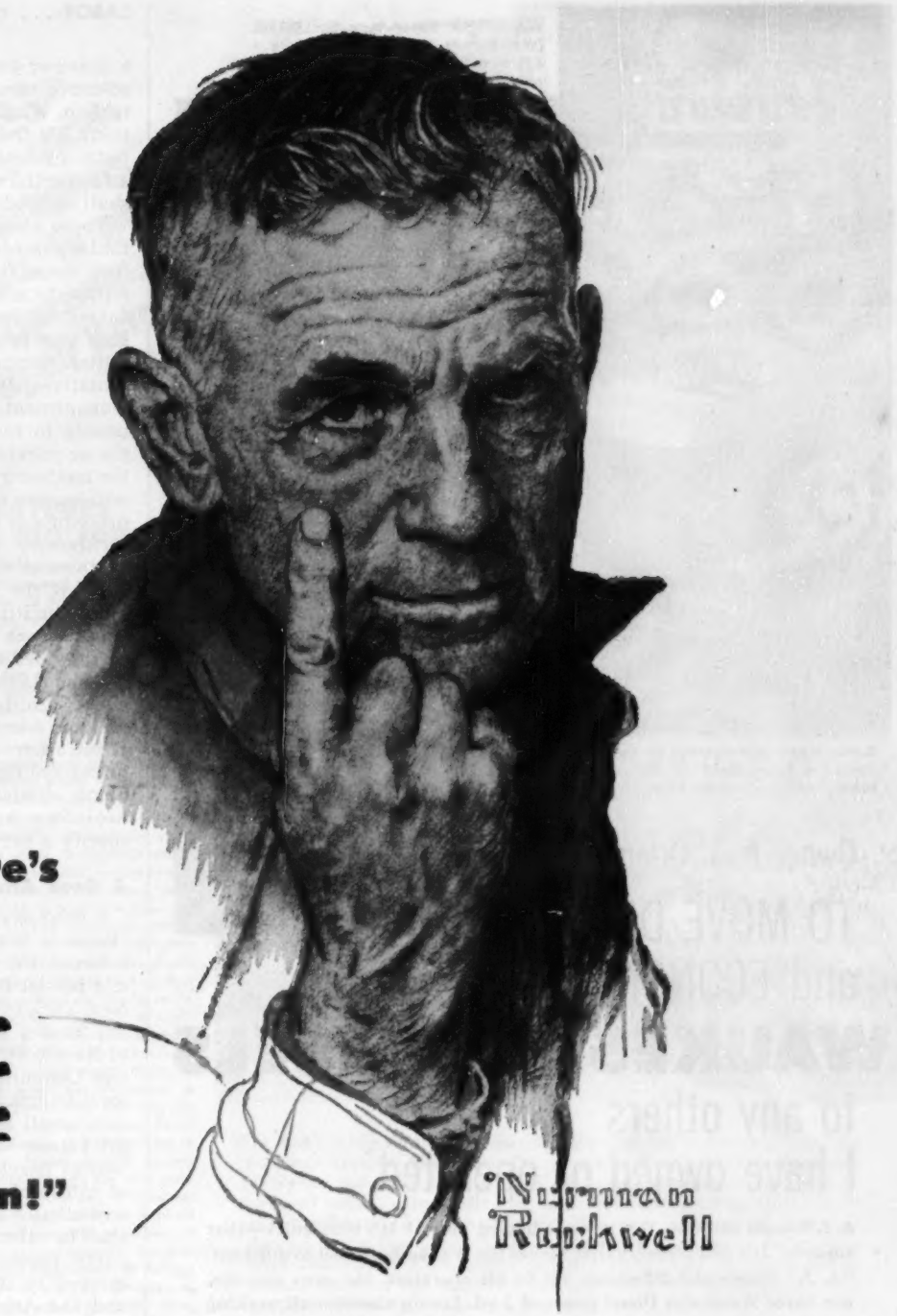
What can this change mean to the contractor who operates in only one state? Just this. If you purchase materials from out of the state in an amount approximating $150,000, chances are that the Board will not assume jurisdiction over a case involving one of your jobs. There probably will not be a repetition of the famous case involving a labor dispute on the construction of a $20,000 home in Greenwich, Conn. To the relatively small contractor it also will mean substantial savings in expensive litigation and back wage payments.

Arbitration

Do your union agreements contain clauses providing for arbitration of grievances? They should. Such clauses provide other means than a strike for settling labor disputes. A recent Bureau of Labor Statistics survey revealed that 89% of the agreements examined (1,442) contained arbitration clauses.

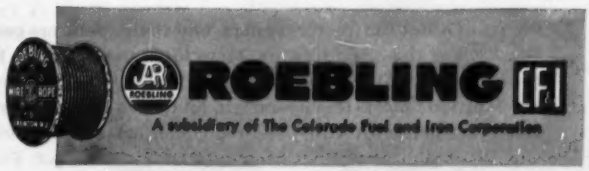
Inclusion in a collective agreement of procedures to follow when disputes arise represents mature union-management relations. Both accept the fact that there are other ways of settling differences besides

(Continued on page 130)

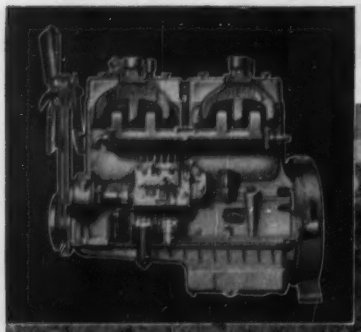


IT'S JUST THAT SIMPLE. There's only one reason in the world why so many wire rope users in the excavating and construction field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your machines.



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4501 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.



WAUKESHA Super-Duty Six DIESEL (WAKD)—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, peak hp 224 at 1600 rpm.

Cutting a new road—part of the Van Wyck Expressway connecting International Air Port with Flushing, Long Island—with a Waukesha Diesel powered Lorain shovel

Owner A. J. Orlando says...

"TO MOVE DIRT FAST and ECONOMICALLY—I prefer

WAUKESHA DIESELS

to any others I have owned or operated"

A. J. Orlando puts on the power—digging starts! It's that quick—that smooth! It's *fast recovery* that makes the Waukesha Diesel so different. "A. J." knows the difference. So do his operators. He owns not one, but three Waukesha Diesel powered 2-yd. Lorain shovels—all working for the A. J. Orlando Contracting Co., Whiteside, L. I., New York.

Plenty of other contractor-owners, and their operators prefer Waukesha Diesels. For the same reasons. More loads per minute. Extra power in the pinches. All-around dependability. And the lively, responsive acceleration, shock-free operation, and clean burning for fuel economy that you get with the patented spherical combustion chamber of the Waukesha Diesel. Check *all* its features—get Bulletin 1415.

231

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
New York • Tulsa • Los Angeles

LABOR . . . Continued from page 128

a strike or job shutdown. The most effective means is voluntary arbitration. What is voluntary arbitration? It's the submission of a dispute, by union and employer, to an impartial umpire whose decision shall be binding on both parties.

These clauses generally provide that a number of steps be taken before the matter in dispute is submitted to arbitration. If a dispute cannot be handled on the job, it goes first to a joint board or committee composed of equal representatives from the unions and management. If the joint board is unable to resolve the dispute, the clause provides for arbitration and the method by which the arbitrator will be selected. The most common procedure is to select an arbitrator satisfactory to both sides. Many arbitration clauses stop here. But what if the parties cannot agree upon a mutually satisfactory arbitrator? Such a contingency should be provided for.

Some clauses stipulate that in the event of a deadlock the arbitrator will be selected by the American Arbitration Association or by a prominent figure in the community. Some eliminate the problem entirely by having the agreement specify a permanent arbitrator.

A Good Arbitration Clause

A good example of an arbitration clause is found in the agreement between the Building Contractors and Mason Builders Association of New York (a member of the Building Trades Employers Association of New York City) and the Executive Committee of the bricklayers' local unions of New York. It says:

". . . all complaints, disputes or grievances arising between the parties hereto involving questions of interpretation of application of any clauses of this agreement . . . shall be submitted in writing by the party hereto claiming to be aggrieved to the other party hereto and the Arbitration Board of the association and the Arbitration Board of the bricklayers' unions mentioned herein (who shall together constitute and be designated as the Joint Arbitration Board) shall . . . investigate such complaints, grievances or disputes and attempt adjustment . . . Decisions jointly reached by the Joint Arbitration Board shall be binding on the parties hereto."

In the event that the Joint Arbi-

(Continued on page 132)

Need more tons of asphaltic concrete for Superhighways, Airports, Turnpikes Expressways, Big-city Markets?

Cedarapids Built by IOWA

NEW 6000-LB.

MODEL G-60

BITUMINOUS MIXING PLANT

3 TONS PER BATCH MEETS BIGGEST DEMANDS . . . CUTS PRODUCTION COSTS!

BIG FEATURES FOR THE BIG JOBS

● Fully automatic controls (optional). Weighs, batches, mixes, discharges and starts new cycle without operator, gives up to 10% increase in capacity. ● Progression indicator lights insure accurate batching. ● 60-cu. ft. mixer capacity BELOW center line of shafts gives 6000 to 6500-lbs. per batch! ● Welded steel mixer body fully jacketed. Liners of ½" manganese steel built in sections for easy replacement. Two U-shaped manganese castings around discharge gate protect mixer body from wear. ● 7" diameter heavy-duty mixer shafts. Spherical, self-aligning bearings rest on heavy H-beams which transmit load to main structure, eliminate strain on mixer ends. Bearings placed away from mixer body for cool running and maximum life. Generously sized anti-friction bearings used throughout plant. ● Efficient "runaround" paddle arrangement. New rigid bar-type double paddle arms, with wear-resisting floating removable sleeves, extend completely through mixer shafts. ● Smooth-running 4' x 14' horizontal vibrating screen produces 4 sizes, plus oversize, has plenty of reserve capacity. Specially adapted for asphalt plants with power unit placed in the open on end of screen, out of heat and dust. ● Rigid heavy-duty columns and structure throughout for minimum vibration. All columns and bracings interchangeable. ● All wiring meets National Standards Association latest specifications. ● Highly portable. Each component unit has its own running gear and erection device. Plant can be erected from columns to hot elevator in less than two days. ● Equipped with 4-compartment cold aggregate storage bin and positive, proportioning type of feeder. ● Asphalt bucket of ¼" plate entirely jacketed. Asphalt spreader pan runs entire width of mixer. ● Pneumatic controls eliminate operator fatigue, speed cycle time in manual operation. ● All hot elevator bearings mounted outside of enclosure for maximum life and easy access for lubrication. ● Exceptional freedom from dust with "scavenger" system and plant design for "breathing" within itself. ● Capacity conservatively rated 150 tons per hour, depending on mixing cycle time.

TODAY's big bituminous paving jobs demand increasingly higher tonnage output of asphaltic concrete. That's why Cedarapids designed the 6000-lb. Model G-60 . . . so you can meet those increased tonnage demands fast, and make a higher profit on each ton produced! Every feature in this new Cedarapids plant is designed for big production . . . 180 tons per hour and more, with completely automatic controls. Every unit in the G-60 is quality-built for the balanced, efficient, long-life performance that keeps maintenance costs low.

Your Cedarapids distributor will gladly tell you the full story of the Model G-60 high-production, high-profit performance. See him today.

IOWA MANUFACTURING COMPANY ● Cedar Rapids, Iowa, U.S.A.

Commander Crushing and Screening Plant

Vibratory Soil Compactor

Motorized Head Pulley

Master Bituminous Mixing Plant

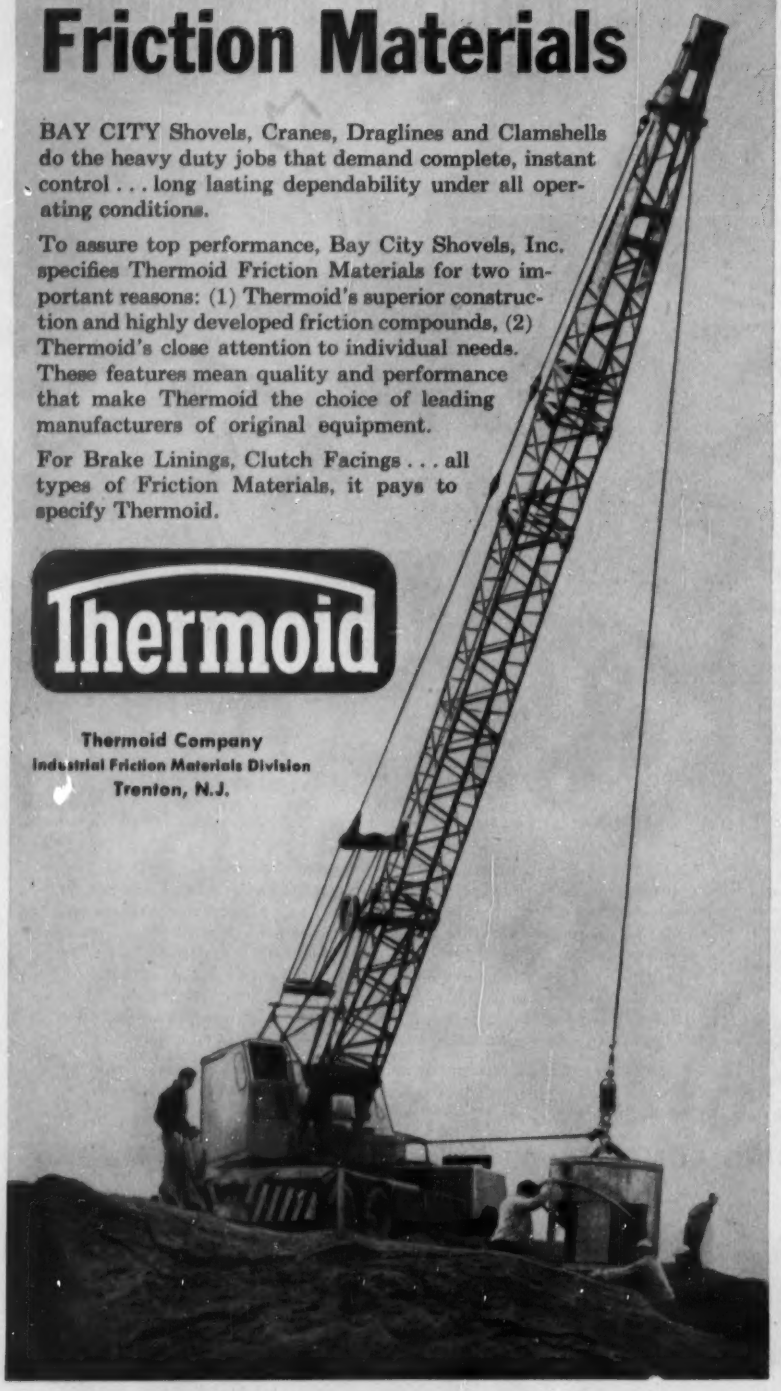
when you require sure instant control..

specify Thermoid Friction Materials

BAY CITY Shovels, Cranes, Draglines and Clamshells do the heavy duty jobs that demand complete, instant control . . . long lasting dependability under all operating conditions.

To assure top performance, Bay City Shovels, Inc. specifies Thermoid Friction Materials for two important reasons: (1) Thermoid's superior construction and highly developed friction compounds, (2) Thermoid's close attention to individual needs. These features mean quality and performance that make Thermoid the choice of leading manufacturers of original equipment.

For Brake Linings, Clutch Facings . . . all types of Friction Materials, it pays to specify Thermoid.



Thermoid

Thermoid Company
Industrial Friction Materials Division
Trenton, N.J.

LABOR . . . Continued from page 130

tration Board cannot agree, the dispute is referred to an umpire selected by the Board. However, the agreement provides the following if the Board fails to agree on an umpire:

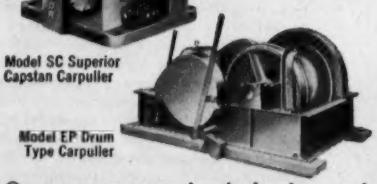
". . . Upon application of either party the President of Fordham University or his successor shall summarily appoint such umpire. Each side shall present its case before the umpire who shall within two (2) days thereafter render his decision. The decision rendered shall be final and binding upon both parties hereto . . ."

This section of the agreement also outlines the method of determining compensation to the umpire, which with incidental expenses is divided equally between the unions and the association. This is a very workable arbitration clause (it is not quoted in full because of space limitations) and of the type that should be used. There are no loopholes to bog down the arbitration machinery, no points upon which there can be endless argument. It has worked for many years, resulting in no serious work stoppages over grievances and job labor disputes.

"Superior" Electric

Carpullers

CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES



Model SC Superior Capstan Carpuller

Model EP Drum Type Carpuller

One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

Write for bulletins and catalogs!

Designed and Manufactured by

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Dey Street, New York 7, N. Y.

(Advertisement)

WHAT FULL CONTROL MEANS

to the operator of an Allis-Chalmers TR-200 Motor Wagon

Fast, Efficient Loading — hydraulic steering control gets the TR-200 under the shovel fast without tiring wheel fight. Large top area permits fast loading with less spillage . . . double steel floor is reinforced with heavy oak plank to absorb loading shocks. Steering jacks and tires are fully protected from falling rock. The TR-200 carries 15 cu. yd. heaped or 18-ton loads.

Quick, Clean Dumping — operator controls two hydraulic jacks to dump and return bowl. Because this unit's wheelbase remains stationary, all four brakes can be set for maximum safety in bank-edge dumping. Rear end dumps far enough over embankment to eliminate rehandling material. Tapered bowl design and 70-degree tilt give quick, complete load ejection. Body may be heated to prevent load freezing.

Safe, High-Production Hauling — no worry when highballing a full load because four-wheel air brakes stop the TR-200 quickly even if the engine should stall. Steering pistons are equipped with stops to eliminate jackknifing. High horsepower-to-yardage ratio and large, rock-lug tires speed your operations . . . even on steep grades and in heavy going. The TR-200 travels at speeds up to 21.6 mph., delivers more loads, reduces idle shovel time.

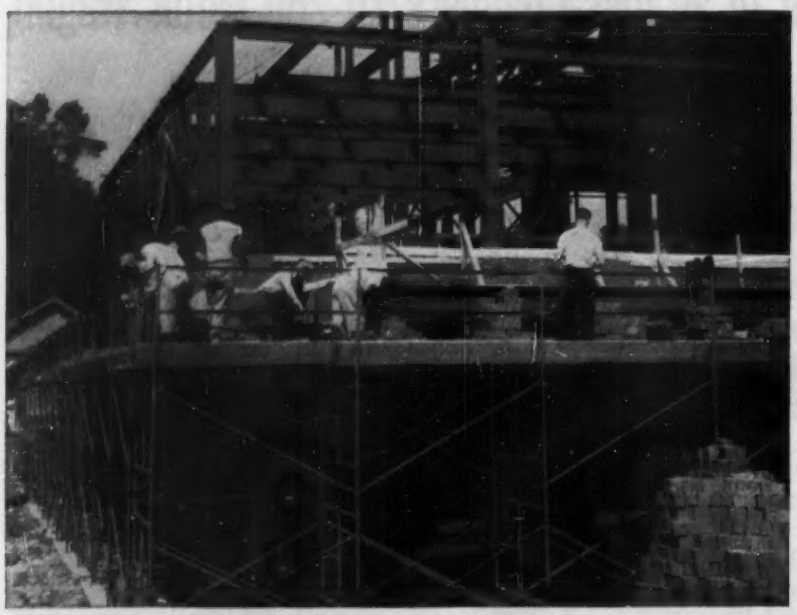
Plus Added Versatility — The same 176-hp. diesel tractor unit and hydraulic controls may be used to operate an interchangeable self-loading scraper body for large scale stripping and hauling jobs.

GET THE FULL STORY FROM YOUR ALLIS-CHALMERS DEALER

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, WIS.

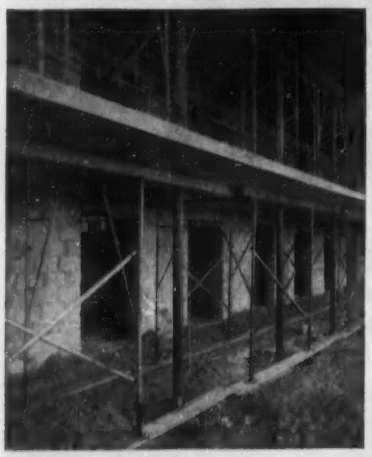
(Advertisement)

"TROUBLE SAVER"® Sectional Scaffolding at Work Around the U. S.



NEW YORK MASONS

work on new power plant building at the State Hospital in Middletown, N. Y. L. B. Strandberg and Sons Co., Inc., Chicago general contractor, purchased the "Trouble Saver" Sectional Steel Scaffolding used on this job. The 5-ft high mason-type frames shown here in use are designed to provide a convenient, multi-level scaffold with a maximum number of sidewall bracket positions for masons' use. "Trouble Saver" Scaffolding, described in free Bulletin PSS-24, is one of the many types of scaffolding offered by PS Co.—the only complete line for every job, big or small. Be sure of the right equipment for your job — follow the practice of experienced contractors and—*when it comes to scaffolding, come to PS.*

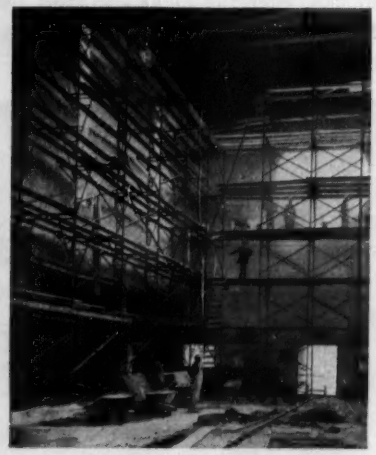


MIAMI SHORES—

For the Blue Horizon Hotel's new cabanas, Florida contractor Morris Burk cut concrete shoring costs by using "Trouble Saver" Sectional Scaffolding and I-beams set directly on scaffolding frames. Plywood panels were laid on I-beams without fastening. The new technique eliminates framing, also ends stripping. "Trouble Saver" Scaffold used: 52 5x5-ft deep-trussed end frames, 20 6½-ft shallow-trussed end frames, 72 6½-ft deep-trussed end frames, 288 plain bases, 288 20-in. adjustable extension legs; 120 5-in. I-beams.

RENOVATION IN ILLINOIS—

Removal of old cornices, installation of new stone copings and a new synthetic granite front, replacing of windows and painting the upper floors of the 8-story building at 12-22 North Michigan Ave., Chicago, required this big "Trouble Saver" Scaffold. To erect the 92-ft high scaffold, The Patent Scaffolding Co.'s Chicago office supplied 315 pre-fabricated scaffold frames to Enjay Construction Company. Here workmen are removing the old cornice preparatory to installing a simple stone coping.



PORTLAND PLASTER

contractors Cann & Gray rented this five-level "Trouble Saver" Sectional Steel Scaffolding structure to safely speed plastering of a new church at S. E. 18th and Division Streets in Portland, Ore. This "Trouble Saver" assembly employed shallow-trussed end frames, 6½ ft high, giving workmen ample headroom when walking along the scaffold platforms. Also note the "Trouble Saver" Scaffolding sidewall brackets, employed here for extra platform working area for plasterers.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDING®

THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street Dept. CM&E Long Island City 1, N. Y.
***West Coast:* 6931 Stanford Ave., Los Angeles 1, Calif.**
Branches in all principal cities

To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

The Engineer's Report

CASE HISTORY

PRODUCT Chevron Starting Fluid

FIRM Young Truck Lines, Salt Lake City, Utah

Starting fluid saves 1152 man-hours per winter!

A LITTLE CHEVRON STARTING FLUID, injected into the intake on the diesel engine of this truck, starts it instantly in temperatures far below zero. The fast starts eliminate delays that amounted to at least 16 hours per week on each of 6 trucks like this operated by Harry L. Young and Sons, Inc., Salt Lake City. Used for hauling mining machinery in the mountain states, these trucks often must be parked outside over night where it is extremely cold. Chevron Starting Fluid starts them anywhere they go without the aid of booster batteries. It is available in 1-pint cans, and in 7- and 17-cc capsules. In 9.9-cc pressure primer steel bulbs, ask for Chevron Priming Fuel. Your fluid supplier also has special primer equipment.

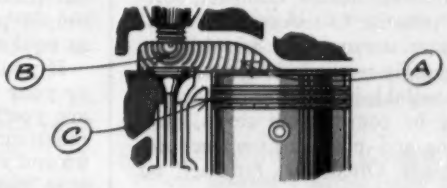
FREE FOLDER tells you more about Chevron Starting Fluid and where to apply it on different engines. Write or ask for it today.

FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.

CHEVRON STARTING FLUID

TRADEMARK REG. U.S. PAT. OFF.

How CHEVRON Starting Fluid Starts Gasoline and Diesel Engines Instantly

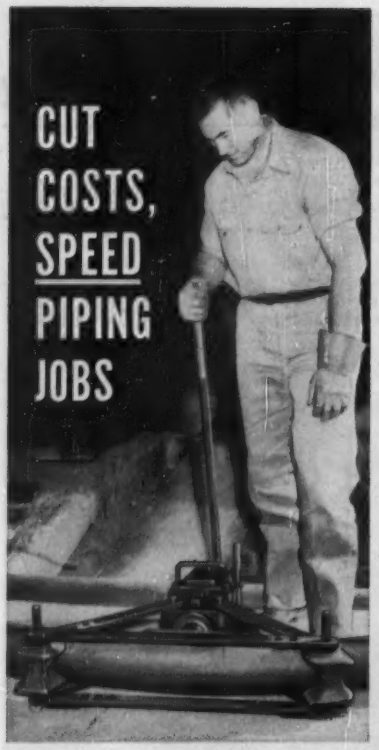


A. Atomizes in lowest temperatures and provides easily ignited vapor in combustion chamber.

B. Pressure, or the weakest spark, fires mixture—turns engine and heats air for regular fuel mixture.

C. Contains lubricant and additives—inhibits cylinder wear and ice formation in primer equipment.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



...with Greenlee Hydraulic Pipe and Conduit Bender

Built for the tough jobs, the GREENLEE Bender saves hours, reduces costs on your pipe and conduit work. With a GREENLEE *one man* quickly makes bends in pipe up to 5", rigid and thin-wall conduit *right on the job*, exactly where and when needed. Many owners report time and labor savings of 50% or more . . . and the cost of many manufactured bends and fittings is entirely eliminated. Compact, portable, versatile to reduce your costs, eliminate construction delays, keep jobs rapidly moving along on schedule. Available in two sizes. Thousands in use by construction crews, electricians and plant maintenance departments. Often pays for itself on the very first job!

FREE BENDER BOOKLET with complete data and illustrations on GREENLEE line of hand and hydraulic benders for tubing, pipe and conduit. Shows how to do various bending jobs quickly and easily to cut job time, reduce costs.

GREENLEE

GREENLEE TOOL CO.
2181 Columbia Ave., Rockford, Illinois

Maintenance Keeps You Ahead

SURFACE must be clean. Surfaces should be roughed up so compound can penetrate.

COMPOUND IS POURED on to fill rivet holes and then brushed out and let dry.

Brush-On Clutch Cure

IF YOU'RE TROUBLED with clutch slippage due to glazing or oil film, here's a brush-on compound the manufacturer claims will not only quickly eliminate that trouble, but also after its application should last the life of the clutch and double its efficiency.

Called Co-Sil-Loy, the compound is a powder alloy of copper, silver and lead in controlled proportions. The metals are suspended in a fluid resin body.

Once the compound is applied to the clutch facings, the minute, powder-like particles penetrate deeply into the metal and friction surfaces.

The resulting new surface, which dries in 10 min, is partially elastic, but maintains rigidity due to the metal particles. This elasticity permits any two clutch facings, working properly, to interlock firmly and smoothly without slippage.

This brush-on compound can be obtained from Dee Dee Co., 1595 Cross Roads of the World, Los Angeles 28, Calif.

Operation Winter

WINTER CONDITIONS quickly can make major problems out of simple problems, at least so far as equipment is concerned.

If your engine is poorly tuned, or your battery is weak, chances are you'll never get it started, so make sure your equipment is tuned up and your battery or starting engine right up to peak efficiency. Generally speaking, the two most important items to watch during cold weather operation are cooling systems and the lubricants and oils you used for servicing.

It's a good idea to drain and flush the cooling system to remove rust and dirt before adding any anti-freeze. Better make sure there are no leaks, too, as anti-freeze will seep through the smallest openings.

After you are certain radiators are clean and tight, protect cooling systems from freezing with the addition of a suitable anti-freeze solution. Alcohol or permanent type anti-freeze may be used, but under no circumstances should the two types be mixed. Most maintenance manuals that come with new equipment give recommendations for the proper amounts of anti-freeze to be added to the water in the cooling system.

Equal in importance to the cooling system are the grades and types of lubricants and oils used during cold weather. Don't forget the winter requirements of your equipment are much different from those for summer operation and require use of different greases and oils.

Consult the lubrication charts for your specific models to learn the exact types and grades of lubricants which must be used. Don't guess at these requirements—remember the information furnished by the manufacturer is given you for your protection.

"Made of U·S·S COR-TEN ...so what?"

...So this! It's got guts!

● Your equipment is supposed to be worked—not laid up. And equipment like this Allis-Chalmers motor scraper, built with tough, durable U·S·S High Strength Steels, has the stamina to *stay on the job.*

Charge a bulldozer into a boulder—wallop a truck with a ten-ton load of slag—grind a bucket through jagged rocks. Mister, if the equipment is built with U·S·S High Strength Steel it will take that kind of abuse—day after day—even at sub-zero temperatures when ordinary steel would fold up.

So what? So your maintenance costs are lower. You have far less down-time to foul up operations. Replacement costs are lower, too. And you do more work in less time . . . that's what!

U·S·S Cor-Ten, U·S·S Tri-Ten and U·S·S Man-Ten steels resist wear, abrasion and impact. They have a yield point 50% higher than ordinary steel. And they resist corrosion, too.

The big fact, however, is that you can give equipment these properties *without increasing weight.* Or, you can use U·S·S High Strength Steels in lighter sections and actually *reduce weight* without reducing the stamina and ruggedness you had before.

We'll tell you more if you'll write to our nearest District Sales office. And our engineers will be glad to help you apply these famous steels to—

Give your equipment the stamina to stay on the job.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS — 1933 — 1953 — TWENTY YEARS OF PERFORMANCE

U·S·S HIGH STRENGTH STEELS

UNITED STATES STEEL

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

The Maginniss Power Tool Co.: Has appointed two new distributors to handle their Hi-Lectric Magic Head Concrete Vibrators and 3-phase, 120-v, 180-cycle generators. They are—Machinery, Inc., Charleston, W. Va. and Southern Gateway Co., Cincinnati, Ohio.

Insul-Mastic Corp. of America: Robert Lear & Son, a Louisville, Ky. firm, has been named distributor for Insul-Mastic.

The Huber Mfg. Co.: Announces the appointment of Casey-Metcalfe Machinery Co., Inc., Los Angeles, Calif., as distributor for its complete line of 3-wheel and tandem rollers, the Huber Maintainer and Motor Grader.

Clark Equipment Co.: Four new dealers have been appointed by the Construction Machinery Division to handle the earthmoving equipment formerly manufactured by the Michigan Power Shovel Co., acquired by Clark last May. The new dealers are—Berry Brothers Machinery Co., Dallas, Tex.; Furnival Machinery Co., Harrisburg, Pa.; Henry H. Meyer Co., Inc., Baltimore, Md.; and George P. Williams Co., Cleveland, Ohio.

Blaw-Knox Co.: Has announced that Shaw Sales and Service Co. of Los Angeles, Calif., has been appointed exclusive representative in southern California for Blaw-Knox construction equipment and clamshell buckets, and Foote construction equipment.

Joy Mfg. Co.: Has appointed American Machine Co., West 1026 Broadway, Spokane, Wash., distributor of Joy construction equipment for eastern Washington and northwestern Idaho.

The Euclid Road Machinery Co.: New distributor of Euclid earthmoving equipment in western Washington and Alaska is Western Tractor and Equipment Co. with headquarters at 2230 First Ave. S., Seattle.

The Galion Iron Works & Mfg. Co.: Effective January 1st, Robert H. Burnup will relinquish his position as district representative in the midwest territory. He will devote his entire time and energies to the distribution and selling of Galion motor graders and rollers, as well as other types of construction equipment, through his new business, The Burnup Equipment Co., located at 11303 Truman Rd., Independence, Mo.

On the Sales Front

The Thew Shovel Co.: Francis S. Battin, formerly assistant export manager, has been named export sales manager,

Sherman Products, Inc.: Appointment of Chesley H. Johnson as district sales manager in the New England and New York territory has been announced. He will make his headquarters in Worcester, Mass.

Republic Rubber Div., Lee Rubber & Tire Corp.: Stanley L. Martin has been appointed field engineer with headquarters in Houston, Tex.

Marlow Pumps: Announces the appointment of Harold Hinnes as manager of the company's newly created service department.

L. B. Foster Co.: George F. McDonald and V. J. Hornak have joined the sales staff of the Los Angeles office.

Pettibone Mulliken Corp.: Announces the appointment of Robert

(Continued on page 140)

New reasons why.. Sherman Power Diggers give you More for '54

NEW "STRESS-DESIGNED DIPSTICK, BOX-TYPE CONSTRUCTION
NEW REINFORCED BOOM EXTRA BEARING SURFACE FOR LONGER PIN AND BEARING LIFE
NEW DOUBLE-BRAID HOSES FOR MAXIMUM DEPENDABILITY
NEW SWING CONTROL SYSTEM GIVES BETTER CONTROL, SMOOTHER ACTION
NEW REGULATOR VALVES FOR SMOOTH, POSITIVE CONTROL OF LIFT AND CROWD CYLINDERS

Important new features, combined with advantages proven by thousands of users, add up to more production for your digging dollar! The Sherman Hydraulic Power Digger is designed and built for that wide range of job requirements beyond the economical use of hand labor and below the efficient use of larger equipment. Yes, between the smallest and largest jobs, you'll find there's always a place for your Sherman Power Digger! Ask your nearby Sherman dealer for an on-the-job demonstration today. Write for free literature, Dept. U49.

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN

Designed, Engineered and Manufactured jointly by SHERMAN PRODUCTS, Inc., Royal Oak, Mich. WAIN-ROY CORPORATION, Hubbardston, Mass.
Patent No. 2,503,825. Other patents pending.

You can't compete if your equipment is obsolete!

With construction activity becoming more competitive, even in the face of high labor costs, it is more important than ever before to take a closer look at your operating costs . . . your dirt moving methods . . . your tools and equipment.

Obsolete methods and equipment take a heavy toll by slowing down output, increasing manhours and increasing repairs and maintenance. Efficient material handling equipment can make the difference between profit and loss on most any job . . . help insure that time and production schedules are met without resorting to expensive overtime and wasteful emergency practices.

If you are not using "PAYLOADER" Tractor-Shovels at present, it will pay you to investigate these fast, flexible, rubber-tired loaders that have proven so profitable for so many material producers and contractors, both large and small.

If you are already "PAYLOADER"-equipped, you'll be pleasantly surprised at the superior performance of the late model "PAYLOADERS". Although "PAYLOADERS" are built to give thousands of hours of dependable service, constant research and engineering improvements keep them out in front in design, construction and performance.

Now is the time to trade in obsolete equipment — to modernize your methods to meet present day conditions — to assure profitable operation in spite of closer competition. Your nearby "PAYLOADER" Distributor will gladly demonstrate any of the new models. The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Ill.

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

HERE'S MORE POWER TO YOU

. . . AT LOWER OVER-ALL COST

When you buy a vehicle or machine powered by Continental Red Seal engine, you "plug in on" specialized knowledge that goes back a long, long time. You benefit from engineering features, and advances in production technique, evolved over a period of more than 50 years. Red Seal dependability, economy and stamina have long been building prestige for quality leaders in the transportation, farm, and construction equipment fields . . . providing *more* and *better* power, at lower over-all cost.

Continental Motors also builds the world's outstanding line of heavy-duty four-cycle air-cooled models, for use on lawnmowers, garden tractors, and similar equipment. 2 to 3 h.p., they feature the exclusive Contex external ignition system, greatest air-cooled engine advance of recent years.

PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation
MUSKEGON • MICHIGAN

SALES AND SERVICE

. . . Continued from page 138

Leibsle as sales manager of Pettibone Wood Mfg. Co., North Hollywood, Calif., Pettibone's recently acquired West Coast subsidiary.

U. S. Rubber Co.: J. J. Davison has been named manager of truck tire sales for the Fisk-Gillette tires division. A. G. Richtmyer has been appointed district manager at Portland, Ore. and R. P. Buis has been named district manager at Kansas City.

Symons Clamp & Mfg. Co.: R. D. Harris has been appointed sales representative in New England and the Hudson River Valley.

Western Machinery Co.: William H. Newton became general sales manager of the Wemco Division in San Francisco.

Aeroil Products Co., Inc.: Has appointed Charles Klevies as Pacific Coast manager. He has been manager of the Seattle branch for a number of years and will make the Seattle office his headquarters. Bill Wonder was recently appointed sales representative in the Midwest.

DeWalt Inc.: Has named Thomas M. Geraghty as district sales manager for a territory comprised of West Virginia, thirteen counties in eastern Kentucky, and that portion of Pennsylvania to the west of Lewiston.

Lehigh Structural Steel Co.: Edward A. Murphy has been named sales manager and Carlton K. Reinsmith was made assistant to the sales manager.

Thor Power Tool Co.: Ernest D. Fischer has been appointed manager of the company's new factory branch office in Atlanta, Ga.

Madsen Iron Works, Inc.: Alex Kostyzak has been named sales manager and will be in charge of domestic and foreign sales of paving plants and other construction equipment items.

Twin Disc Clutch Co.: Appointment of Jack N. Yetter to manager of sales promotion with headquarters at the home offices at Racine, Wis., and of Mel H. Woodward as Mr. Yetter's successor as manager of the Tulsa, Okla. district, has been announced.

Motorola Communications & Electronics Div.: John P. Tansey was recently appointed national service manager succeeding Fred Schnell who has been designated staff assistant to the vice-president.

Timken-Detroit Axle Div., Rockwell Spring and Axle Co.: Announces the appointments of C. C. Bartell as vice-

(Continued on page 142)

Shown here is a Talbert Beam Deck Trailer, Model T3BD-75-RG-RA with a Talbert Single Axle Dolly loading a Marion, Model 93M. This rig is owned by W. H. Hinman, Inc., of North Anson, Maine.

SIMPLE LOADING OPERATION

...the TALBERT way

Talbert Trailers are designed so as to permit loads of this type to be hauled on the job. The empty weight has been held to a minimum, permitting the contractor to haul up to a yard and half machine legally in the State of Maine.

Write for New Talbert Catalog No. 104

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers.

THE TALBERT-WAY IS THE EASY WAY

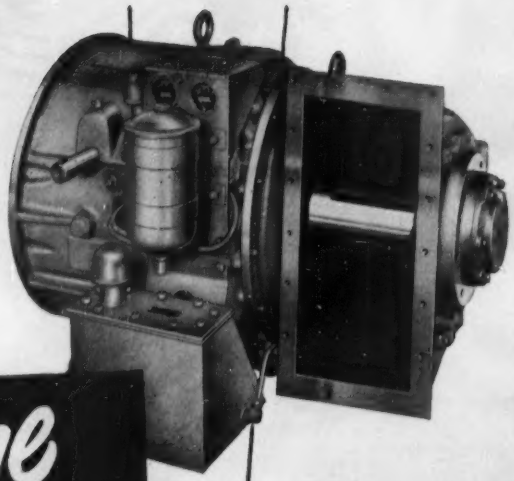
TALBERT CONSTRUCTION EQUIPMENT COMPANY
7952 W. 47th St., Lyons (Chicago Suburb) Ill.

Name.....

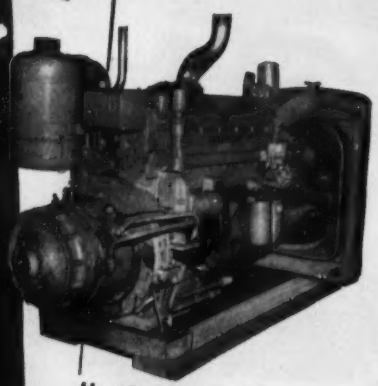
Firm Name.....

Address.....

City..... State.....



Caterpillar D337 engine (below) equipped with Model CF Torque Converter. Twin Disc Industrial-Type CF Converter (right) available in three sizes, with seven capacities each to handle any type gas or diesel engines from 40 to 1,000 hp.



Torque Converter Drive for your New Power Unit

Next time you talk to your engine dealer about that new power unit, ask him about supplying you with a complete Power Unit equipped with a Twin Disc Torque Converter.

Find out how a small additional investment will return multiplied dollars in greater performance, faster work cycles, lengthened equipment life, easier and more efficient operation . . . with Twin Disc—the Torque Converters that have set the pace throughout industry. Contact your engine dealer . . . today!

Here's what the "Twin Disc-equipped complete Torque Converter Power Unit" provides:

- Picks up heavy loads smoothly without slipping the clutch.
- Multiplies engine torque up to 6 times.
- Absorbs shock loads . . . saves clutches, engines, drive line components.
- No mechanical connection . . . drives through fluid action.
- Engine operates in maximum efficiency range at all times.
- Automatically matches power to load demands.
- Permits "hovering" or holding under power.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

SALES AND SERVICE . . .

Continued from page 140

president in charge of sales of axles and related equipment and R. M. Hays as vice-president in charge of trailer axle activities. U. R. Gress has been appointed assistant sales manager of trailer axles with office at the division's Kenton, Ohio plant.

Wall Colmonoy Corp.: Appointment of Elmer J. Lell as sales manager has been announced.

In the Main Office

American Hoist & Derrick Co.: Harold O. Washburn, former president was elected chairman of the board; and John E. Carroll, former vice-president of sales, was elected president.

Hercules Motors Corp.: John C. Keplinger has been elected president.

Special Mention

United States Lift Slab Corp.: Has taken over the Youtz-Slick Lift Slab method of construction—will be the domestic and foreign licensor. Jack Frost is president of the firm which has temporary headquarters at 915 Congress St., Austin, Tex.

The Oliver Corp.: Has acquired the outstanding capital stock of Be-Ge Manufacturing Co., Gilroy, Calif. Be-Ge's line of construction machinery and farm equipment will diversify and strengthen Oliver's position in the industrial and agricultural field, a spokesman for Oliver explained. Oliver, which operates 9 plants in the middle west, acquired in the transaction Be-Ge's 229,000-sq ft plant in Gilroy, plus a new building recently completed for production of 76-mm cannon. Be-Ge will operate as an Oliver subsidiary under its present management headed by Albert Gurries, president, and David V. Stout.

Gar Wood Industries, Inc.: Announces the organization of the Mattoon Division to handle the production of Gar Wood bulldozers and scrapers sold through Allis-Chalmers industrial tractor distributors. Hunter Dietz has been appointed division manager and Dave Davis, tractor equipment sales manager.

Rice Pump Machine Co.: Has announced new and larger manufacturing facilities at Belgium, Wis., where it is now located.

Templeton, Kenly & Co.: Has moved into its new plant in Broadview, Ill., a suburb of Chicago. The single-story plant, located on a five-acre tract at Gardner Rd. and 16th St., contains 96,000 sq ft of space. The

(Continued on page 144)

How to operate BIG with little effort!

Watch an Oliver "OC-18" at work. Watch how smoothly the operator swings this big tractor into position . . . how easily he handles it under a load. Notice the finger-tip air steering and over-center clutch bar that permit virtually one-hand operation. You'll see why work is easier, production higher with the Oliver "OC-18"

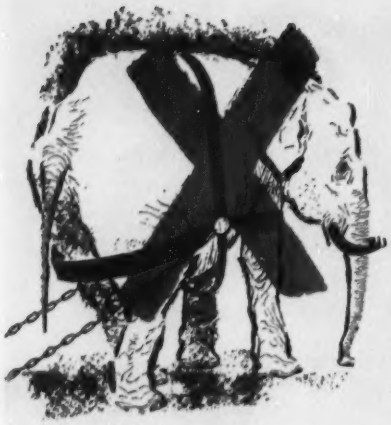
In the toughest going, the "OC-18" has what it takes to move right through. Lugging power steps up as the husky diesel engine slows down under load. And, with 133 drawbar H.P. and power on both tracks, even on turns, it's no wonder the "OC-18" delivers big payloads with ease.

Why not give the "OC-18" a try on your operation? You'll find its power and balance . . . easy servicing and low maintenance . . . sturdy new final drive and easy handling add up to one thing—more profit for you! Call your Oliver Industrial Distributor, test drive the "OC-18" today!

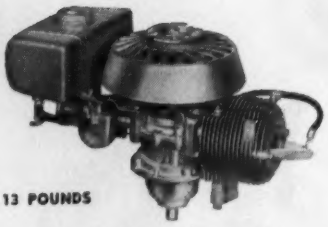
THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors



be modern—
go *Lightweight*



13 POUNDS

The POWER PRODUCTS *Lightweight* packs more power per pound

When it comes to lightweight power nothing can touch this engine. Not only is it amazingly lightweight, but it has every important quality feature to assure long, dependable performance

- LIGHTWEIGHT
- MINIMUM EFFORT STARTING
- LONG LIFE, LESS MAINTENANCE
- FULL CARBURETION
- BALL BEARING MAIN BEARINGS
- SEALED DRIP PROOF CRANKCASE
- FULLY ENCLOSED FLY-BALL GOVERNOR
- NO OIL CHANGING OR CHECKING
- CLOG FREE COOLING SYSTEM

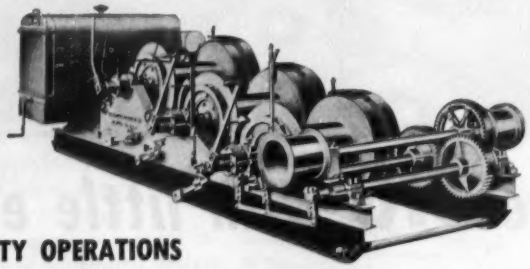
PP

For portable equipment, you can't find a better engine for lightweight and dependability.

be modern • go *Lightweight*

POWER PRODUCTS CORPORATION
GRAFTON, WISCONSIN

ok HOISTS



FOR HEAVY-DUTY OPERATIONS

Here's a rugged and dependable hoist that will tackle your heaviest construction job, give you trouble-free operation throughout its long life . . . the OK Hoist.

OK manufactures hoists for any and all types of building construction, in single, double or triple drum styles, powered either by gasoline or electricity from 10 to 175 horse power.

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- **PORTABLE ELEVATORS**
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  105, 160 or 210 cu. ft. of air per minute
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Write today for further information and specifications on these OK products.

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JOHN C. MOTTER PRINTING PRESS CO.

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SALES AND SERVICE . . .

Continued from page 142

efficient one-floor layout of the plant permits smooth flowing production of all types of Simplex lever, screw and hydraulic jacks.

Pipe Linings, Inc.: Has purchased facilities for coating steel pipeline exteriors from Bechtel Corp., San Francisco. The Los Angeles firm, a subsidiary of American Pipe & Construction Co. purchased Bechtel's Somastic Division at Watson, Calif. and will move to Watson where new quarters are being constructed, by the end of the year. In addition to the 2,000 sq ft of office space being built, the firm may construct a warehouse.

Caterpillar Tractor Co.: A new parts depot will be located in Denver, Colo., and is expected to be in operation about February 1, 1954. It will improve parts service for approximately 14 Caterpillar dealers in Colorado, New Mexico, Wyoming, Utah, Texas and Montana.

Association Activities

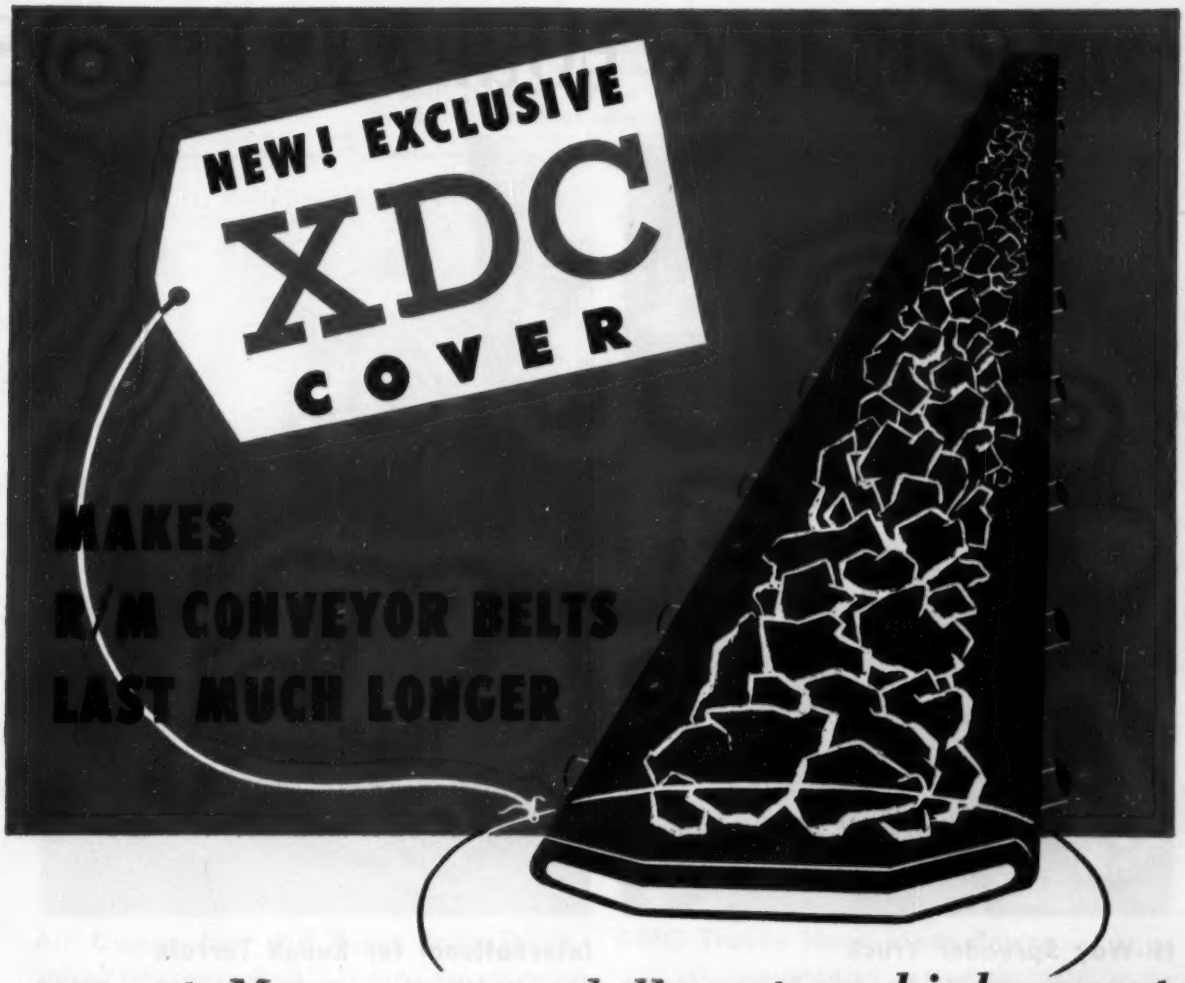
Structural Clay Products Institute: Russel G. Eshenaur, president of Glen-Gery Shale Brick Corp., Reading, Pa., was elected president at the annual convention at the Greenbrier, White Sulphur Springs, W. Va. John H. Stewart of Stark Ceramics, Inc., was named vice-president, while George Gammie, Illinois Brick Co., was re-elected treasurer. Joseph J. Cermak, continues as secretary.

The Asphalt Institute: Elected Raymond Harsch chairman of the executive committee for the coming year and re-elected Bernard E. Gray president. Mr. Harsch is manager of the Asphalt Dept., Shell Oil Co., San Francisco.

American Road Builders' Assn.: The annual meeting of ARBA will be held January 5, 6 and 7, 1954, at Atlantic City, N. J.

Concrete Industry Board: Roger H. Corbetta, president of the Corbetta Construction Co., Inc., general contractors, has been re-elected chairman for a third term. William J. McIntosh, district engineer for the Portland Cement Association, was elected secretary; and Dugald J. Cameron, president of the Concrete Reinforcing Steel Corp., was re-elected treasurer.

American Concrete Inst.: William A. Maples was named secretary-treasurer at a meeting of the Board of Direction in Houston, Tex., October 28. For the last five years he has been associate and managing editor of the Journal of the ACI and latterly acting secretary-treasurer.



you get More use per dollar at no higher cost

Now, an amazing new conveyor belt cover compound developed by Raybestos-Manhattan provides phenomenal resistance to wear and tear. Most conveyor belt failures start with wear of the cover. "XDC" Cover greatly extends the life of R/M Conveyor Belts by giving protection never before attained against wear, abrasion, cuts and tears which lead to costly internal damage. The new "XDC" Cover greatly increases the benefits of Raybestos-Manhattan's other outstanding developments in conveyor belt design . . . Constructions like extra flexible RAY-MAN "F," extra-cushioned HOMOCORD, HOMOFLEX and extra-high tension RAY-MAN. This major advance in rubber engineering puts longer life, "More Use per Dollar" into tough, dependable R/M Conveyor Belts. When you are thinking about conveyor belts, call an R/M representative.

R/M

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

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Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
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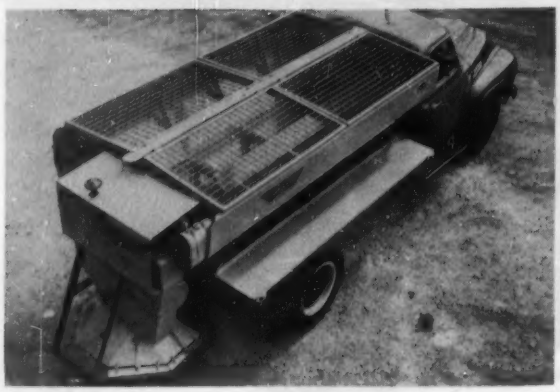
CONSTRUCTION EQUIPMENT NEWS



Hi-Way Spreader Truck

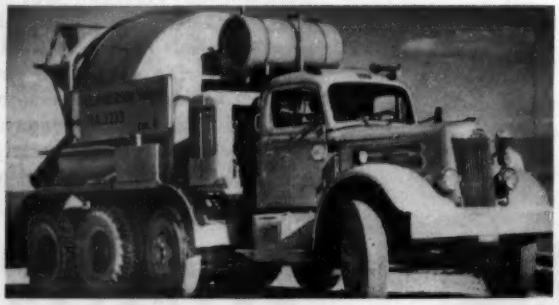
This is a brand new 1954 model of a Hi-Way Spreader truck recently introduced. It's a self-contained unit mounted on the truck frame of a Ford F-600. It can be used to spread sand, salt and cinders and also for seal-coat work, dust control, road stabilization, ice-control, etc.—**Highway Equipment Co., Inc., Cedar Rapids, Iowa**

International for Rough Terrain

The new International model R-140-4x4, is one of the two four-wheel-drive models in four wheelbases designed especially for rough terrain use. This one, mounting a Failing drilling unit, weighs 11,000 lb. Axles are single reduction hypoid gear type.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

New Dodge Trucks for Construction

Expected to find wide use in the construction industry is this new high-tonnage Dodge 6-cyl, 171-hp truck. This truck has a 413-cu in. engine, hydraulic tappets, seat inserts in both intake and exhaust valves, and twin carburetion. It has a side-opening and removable section hood for convenient access.—**Dodge Div., Chrysler Corp., Detroit, Mich.**



White Now Has Steering Pusher Axle

A new model truck for the construction industry is the White truck called the "Centipede." This 5½-yd mixer model is equipped with power steering and two-way radio. The steering pusher axle is a single-tired axle mounted ahead of the tandem drive axles. It has payload and load tolerance advantages.—**White Motor Co., Cleveland 1, Ohio.**

. . . About Trucks

The real "bread-and-butter" tool of the contractor is trucks. Usually it is the first tool the contractor needs and buys. It is the first tool on a new job, and it's the last one to leave after the job has been completed. On any construction job, big or small, you'll find big and small trucks. Too often the importance of trucks is overlooked in the construction industry, so we'll look over a few here.

Air Compressor and Dump Body Truck

This air compressor-dump body truck was announced jointly by two manufacturers. The equipment consists of a Davey 105 Auto-Air unit and a Galion Allsteel model contractor's body. The compressor delivers 105 cfm and drives direct from truck engine. Dump body by Galion is 90 in. long, 78 in. wide.—**Galion Allsteel Body Co., Galion, Ohio.**

Chevrolet Has Three New Engines

The new Chevrolet trucks feature three new engines, with horsepower increased up to 135 Automatic transmissions up through the one-ton model are optional. The whole Chevrolet line has been re-engineered.—**Chevrolet Motor Div., General Motors Corp., Detroit, Mich.**

GMC Trucks Have More Power

GMC calls this 1954 pick-up truck the highest powered, "sweetest styled" truck on the market. They have used plenty of chrome and even put out two-tone paint jobs on this 125-hp model. Seats are more comfortable, steering wheel is T-braced and a new one-piece curved windshield.—**GMC Trucks, General Motors Corp., Detroit, Mich.**

Roadranger Truck Transmissions

Truck manufacturers and operators report satisfaction with the new Fuller Roadranger transmission. This one-stick, 10-speed transmission is being offered by more than a dozen truck manufacturers. For construction hauling, this dumper train pictured includes 10 and 20-ton dump bodies pulled by Autocar diesel Model DC-100-TN. Transmissions provide two-speed ranges, without need for auxiliary transmission or two-speed axle.—**Fuller Mfg. Co., Kalamazoo, Mich.**

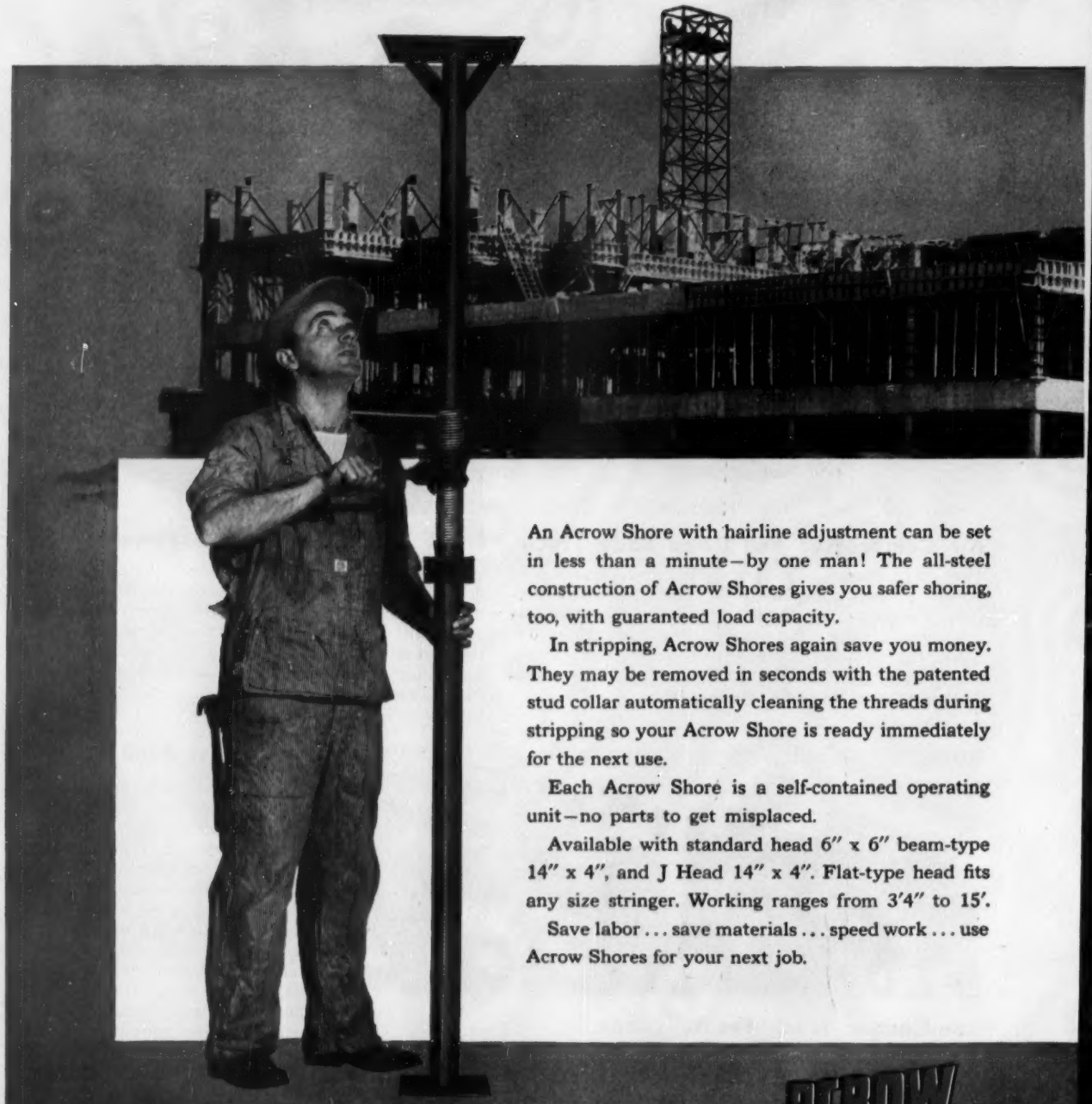
Truck Cost Book

The 32nd annual edition of the Autocar truck cost record book is now available for distribution. This book provides a simple but accurate system for keeping a record of operating costs on each vehicle in a fleet. Space is provided for a truck's daily record of miles traveled, trips, units carried, wages, quantity and cost of gasoline and oils, depreciation, interest, taxes and other maintenance items. A double column provides for comparison of actual and estimated costs. It is available without cost and is being distributed through the factory branches and dealers of **The Autocar Div., The White Motor Co., Ardmore, Pa.**

(Continued on page 150)

with ACROW ADJUSTABLE STEEL SHORES, You...

GET 'EM



An Acrow Shore with hairline adjustment can be set in less than a minute—by one man! The all-steel construction of Acrow Shores gives you safer shoring, too, with guaranteed load capacity.

In stripping, Acrow Shores again save you money. They may be removed in seconds with the patented stud collar automatically cleaning the threads during stripping so your Acrow Shore is ready immediately for the next use.

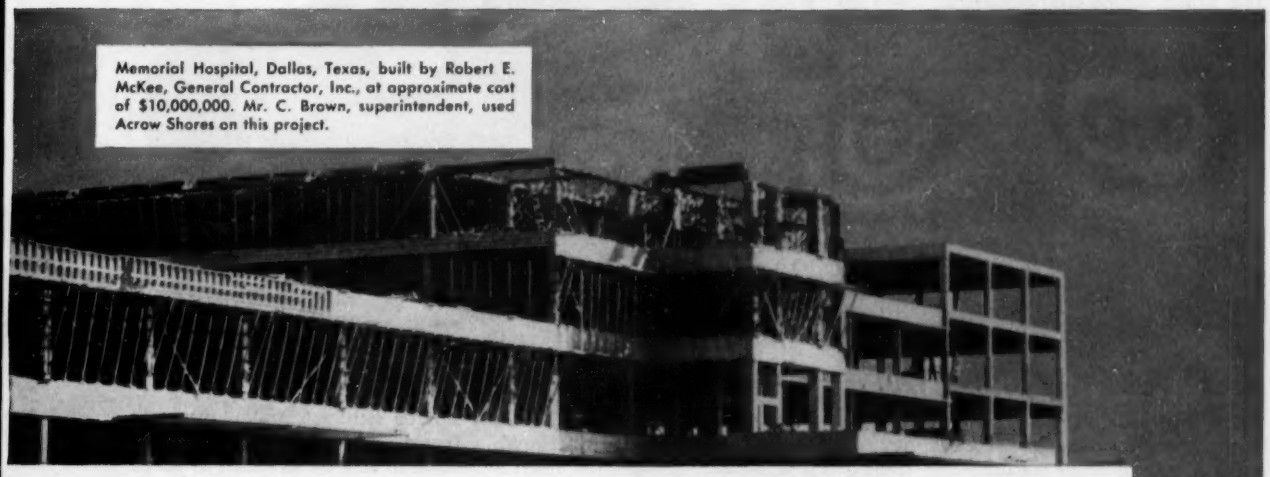
Each Acrow Shore is a self-contained operating unit—no parts to get misplaced.

Available with standard head 6" x 6" beam-type 14" x 4", and J Head 14" x 4". Flat-type head fits any size stringer. Working ranges from 3'4" to 15'.

Save labor . . . save materials . . . speed work . . . use Acrow Shores for your next job.

ACROW.....

UP FAST



Memorial Hospital, Dallas, Texas, built by Robert E. McKee, General Contractor, Inc., at approximate cost of $10,000,000. Mr. C. Brown, superintendent, used Acrow Shores on this project.

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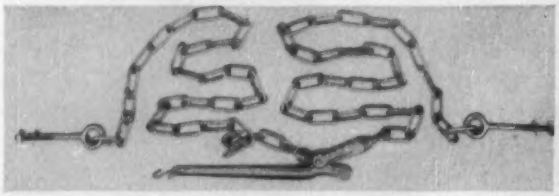
ADJUSTABLE STEEL SHORES

THE WORLD'S LARGEST SELLING SHORE

Mack Trucks Offer Many Types

The Mack Truck line design is based on "What you (the operator) asked for." The new B Series Macks include both trucks and tractors in four- and six-wheel types, covering a range from 17,000 through 70,000 GVW, and are powered either by gasoline or diesel engines, ranging up to the 170-hp class.—**Mack Trucks, Inc., 350 Fifth Ave., New York, N. Y.**



Anti-Spread Device for Trucks

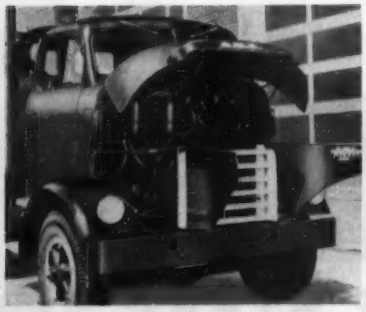
Spreading difficulty in open- or closed-type trailers is overcome by this anti-spread device. Forged-eye bolts are secured to trailer sides, then chain is taken up at middle and locked by a 12-in. lever-type load binder.—**Canton Mfg. Co., Canton, Ohio**

GMC Introduces Silent Muffler

A new truck Silent Power exhaust system has reduced objectionable truck exhaust noise. The new muffler has been increased in size by as much as three and one-half times and is made from heavier steel. —**GMC Truck Div., General Motors, Pontiac, Mich.**

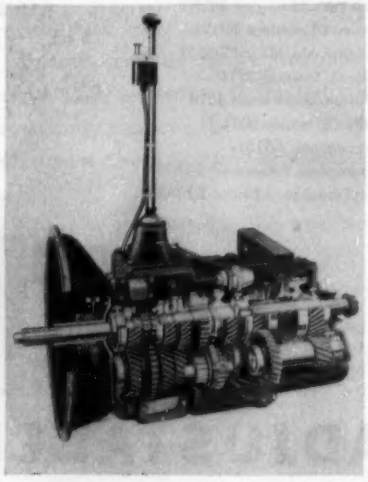
Heavy-Duty Wheel Block

Here's a Safety Wheel Block made of high-strength alloy steel that gives real holding power for blocking heavy equipment. It has a 15x10-in. base with heavy steel gripper teeth to help it dig in. It is 14 in. high and will accommodate all size tires. It is especially useful for providing anchorage during winching operations.—**Calumet Steel Castings Corp., Hammond, Ind.**



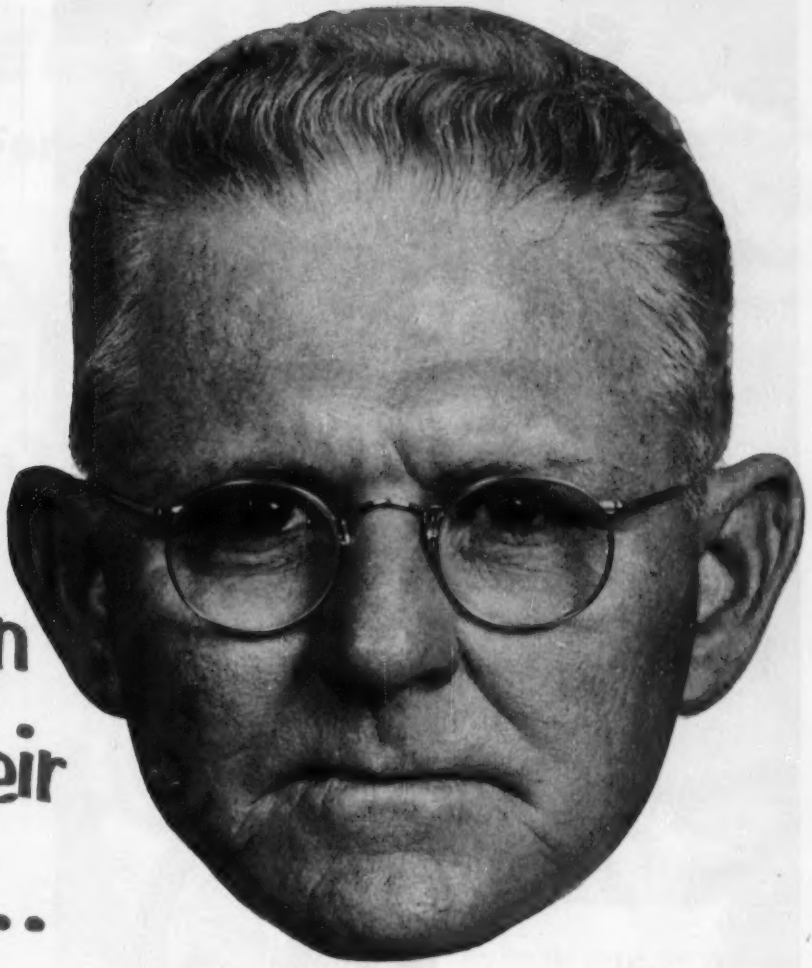
Heavy-Duty Cab-Over-Engine

Bumper to back of cab dimension of only 72 in. is the feature of the new GMC cab-over-engine line. Five models in the heavy-duty class have shortenend length.—**GMC Trucks, General Motors, Detroit, Mich.**



New 8-Speed Transmission

Finger-tip control on the shifting lever is the feature of this new Fuller R-45 Roadranger Transmission. It's available for 125- to 160-hp trucks and weighs only 457 lb.—**Fuller Mfg. Co., Kalamazoo, Mich.**



"This suggestion solved their problem... ...Saved them Money, too!"

The public works department of a large Southern county had run into a serious problem with their road building equipment.

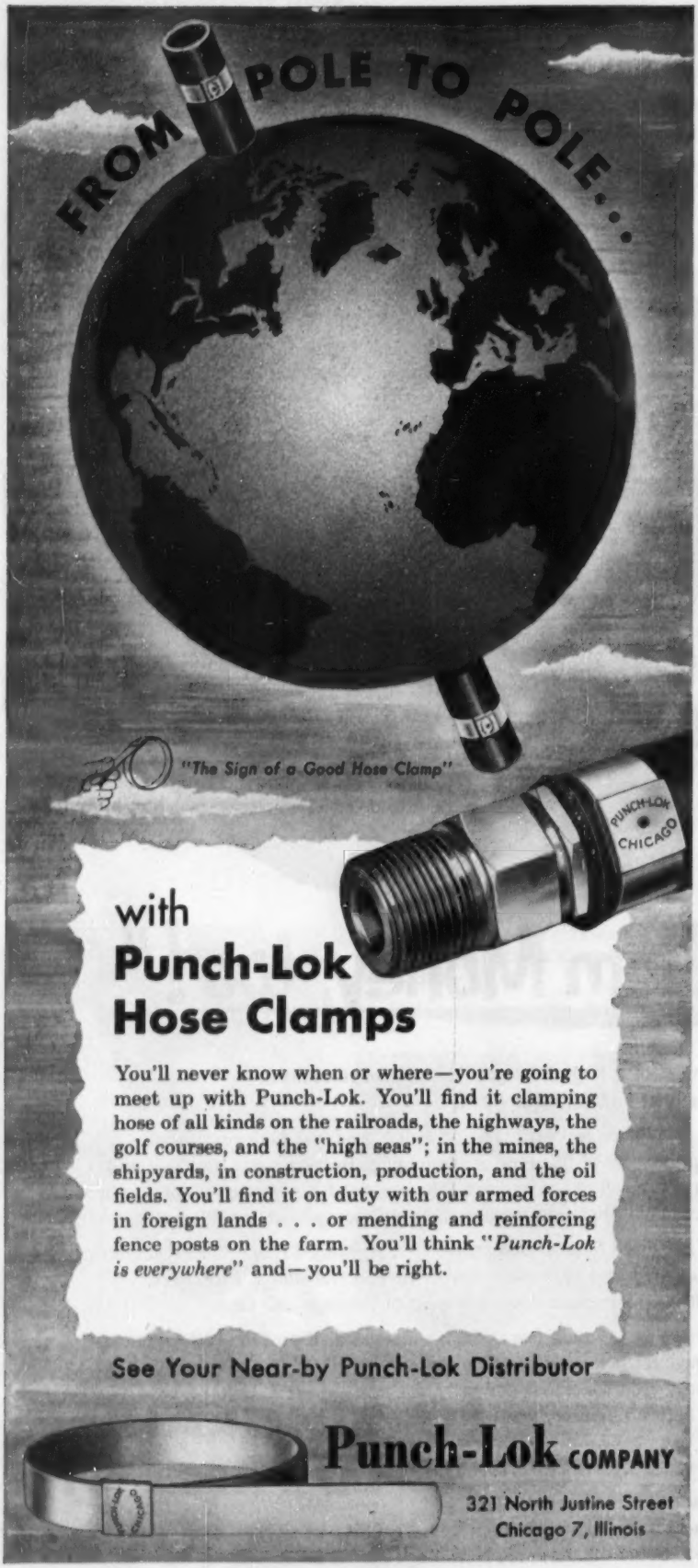
Sinclair Representative J. E. Gilmer reports, "The oil being used was high-priced but certainly *not* up to the requirements of this type of equipment. Bearing wear was high and carbon and sludge were found in all of the engines. There was definite need of an oil with better oxidation stability under extreme operating temperatures and heavy load conditions.

Mr. Gilmer continues, "I suggested Sinclair SUPER TENOL®, pointing out that this oil contains special additives to clean engines and *keep them free* of carbon and sludge. Moreover, its better oxidation stability helps prevent corrosive wear of bearings and rings.

"The county warden gave SUPER TENOL a test – the results of which proved my suggestion was right. SUPER TENOL gave far better service than the more expensive oil previously used. Of course SUPER TENOL is now used exclusively in all of this county's road building equipment."

SINCLAIR LUBRICANTS

Why not give a Sinclair Lubrication Engineer the chance to help solve *your* lubrication problems. *There's no obligation.* Contact your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.


FROM POLE TO POLE...
"The Sign of a Good Hose Clamp"
PUNCH-LOK
CHICAGO
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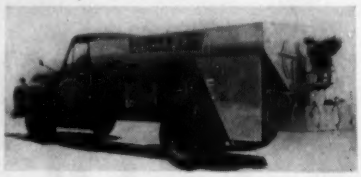
Hose Clamps
You'll never know when or where—you're going to meet up with Punch-Lok. You'll find it clamping hose of all kinds on the railroads, the highways, the golf courses, and the "high seas"; in the mines, the shipyards, in construction, production, and the oil fields. You'll find it on duty with our armed forces in foreign lands . . . or mending and reinforcing fence posts on the farm. You'll think "*Punch-Lok is everywhere*" and—you'll be right.
See Your Near-by Punch-Lok Distributor
Punch-Lok COMPANY
321 North Justine Street
Chicago 7, Illinois

EQUIPMENT NEWS . . .

Continued from page 150

DIRECTIONAL CONTROL VALVES FOR MOBILE EQUIPMENT — The Parker Appliance Co. of Cleveland has added a new complete series of directional control valves for mobile equipment to its lines of hydraulic system components. The spool groove on this new valve is coined straight down in a V-slot which permits more accurate control and smoother metering, according to the manufacturer. Tests that were conducted revealed that smooth metering eliminated shock loads on hydraulic systems and consequent shock loads on mechanical parts. It is designed in four sizes to allow flow of 8, 16, 23 or 35 gpm. There are 1-, 2-, 3- and 4-spool models. The valve is adaptable to existing models of mobile equipment. Additional information may be obtained from the **Parker Appliance Co., Cleveland, Ohio**



SAND AND CINDER SPREADER— A new model of the Baughman "SC" sand and cinder spreader for ice control has improved features such as the fifth-wheel friction drive, the auxiliary distributor power, and the split-bottom dump. The new spreader is available in three body styles.— **Baughman Mfg. Co., Jerseyville, Ill.**

OILER FOR PNEUMATIC TOOLS— Designed to meet air tool lubrication requirements, the Wright oiler is the latest product of Wright creative engineering. Outstanding features claimed for this new oiler: it works, operates in all positions and never clogs. Its patented wick filter prevents clogging and completely atomizes the oil for better lubrication. In addition, it is claimed its oil metering valve cannot vibrate shut. Weighs less than 2½ lb and can be attached directly to any pneumatic tool to produce a steady regulated oil flow. Available in one-half pint size, Model AO-8, and a one pint size, Model AO-16. Additional details can be obtained from the **Wright Power Saw and Tool Corp., 292 Longbrook Ave., Stratford, Conn.**

CLEVELAND TRENCHERS

...For Better, Faster, Cheaper

HIGHWAY WIDENING

Highway Widening

Proved superior performance in highway widening and highway improvement work has brought about a widespread and ever-increasing use of Cleveland Trenchers in projects of this type. Here are just a few of the many underlying reasons for Cleveland's outstanding popularity in this field.

1. Clevelands complete the cut in one pass . . . help you keep all phases of a widening job close together, not strung out along the highway.

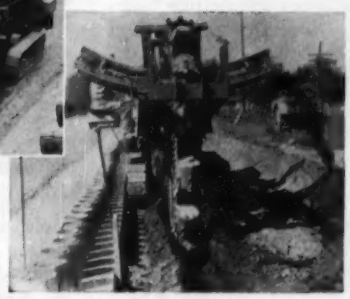
2. Clevelands cut clean, accurately, right to grade . . . make every cut a real precision job.

3. Clevelands cut fast . . . real mechanical efficiency, not brute force, for speed even on the tough jobs.

4. Clevelands truck load easily . . . no additional equipment or men are needed when spoil haul is required.

5. Clevelands are *versatile* . . . cut your tile trenches—dig *all* kinds of trench—give you high production at low cost—with minimum of service and repairs—day after day—year after year.

TRUCK LOADING



DRAINAGE TRENCHING

GET THE FULL **CLEVELAND** *STORY FROM YOUR LOCAL DISTRIBUTOR*

THE CLEVELAND TRENCHER CO.

Pioneer of the Modern Trencher

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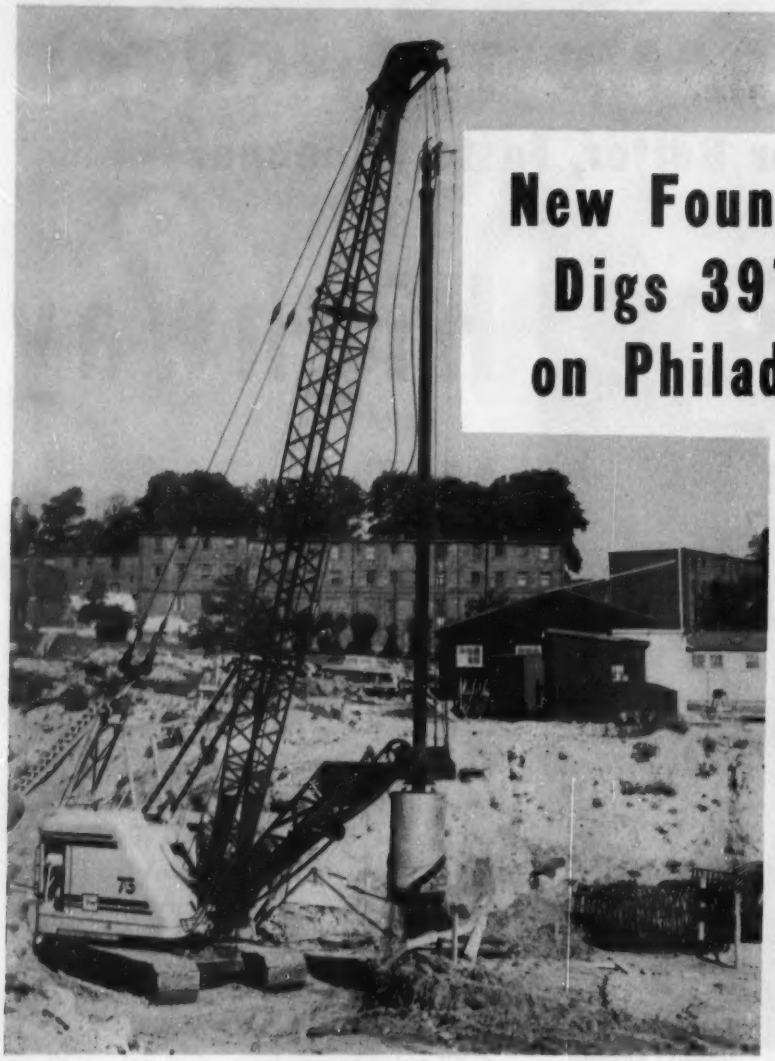
Advertisement

New Foundation Borer Digs 397 Footings on Philadelphia Job!



Foundation Borer mounted on Gar Wood 75B crane.

Buckley & Co., Inc., Philadelphia contractors, are using a new Gar Wood foundation borer attachment to make unusually rapid progress on a contract to dig 397 footings for the new Eastern Pennsylvania Psychiatric Institute.

Jack Buckley, Jr., superintendent on the job, says, "This new machine is getting the job done 8 to 10 times faster than we've been able to do before. The independent controls make the machine extremely maneuverable and it certainly meets our needs for a fast, smooth-operating borer."

Working on a sub-contract from Turner Construction Co., the Buckley organization is boring down as deep as 55 ft. with the holes from 36 to 54 inches in diameter.

A regular Gar Wood model 75B crane with 85-ft. boom is fitted with the foundation boring attachment using a 70 ft. stem. Operating speed has averaged about 1 ft. per minute.

Close-up shows the smooth cut possible with a Gar Wood foundation boring attachment . . . When maximum desired depth is reached, vanes on bucket can be opened to bell out the bottom of the hole to a maximum diameter of 90 inches . . . This feature allows the hole boring and belling to be combined into one easy production line operation . . . Bucket is placed in operation with a rotating motion to load. When full it is lifted out of hole, vanes on bucket are opened to permit dumping. The entire operating cycle is completely mechanical.

Gar Wood's exclusive factory installed foundation borer attachment is completely convertible . . . Shown above mounted on a Gar Wood model 75B crane, it can be just as easily used with the 75BT truck crane or the standard 75A crane.

It can be utilized on a wide variety of applications including foundations, piers, caissons, piles, footers, ballast holes, buried tanks, wells, wall supports, soil borings, septic tanks, strata samplings, dikes and shores, and harbor and river improvements.

All four basic types of borings—straight flat, caissoned, bell bottom and multiple taper—can be quickly and easily handled without adjustments.

The cutting edges and belling vanes are hydraulically operated while bucket is driven by a positive chain drive . . . Only Gar Wood offers this new, profit making attachment—the only heavy-duty tool available for constructing the new unreinforced foundation footings.

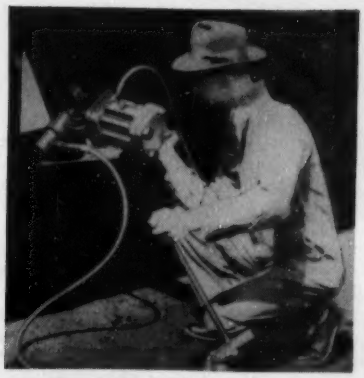
The Gar Wood line of excavators includes both standard and heavy-duty cranes, shovels, trench hoes, clamshells, pile drivers and magnets with a heavy-duty truck crane also available.

Gar Wood also manufactures a complete line of bulldozers with both hydraulic and cable operation for every model of A-C tractors. Also the famous line of Buckeye ditchers, spreaders and finegraders.

GAR WOOD INDUSTRIES, INC.

FINDLAY DIVISION • EXECUTIVE OFFICES • WAYNE, MICHIGAN

Construction Equipment: Excavators, Dozers, Ditchers, Scrapers, Spreaders, Finegraders. *Truck Equipment:* Dump Truck Bodies & Hoists, Winches & Cranes.



AIR VIBRATOR—Here is an air vibrator, powerful and portable, that will quickly unload material. It is said to be easy to handle and operate and is equipped with a hydraulically operated mounting clamp which can be attached quickly to hoppers, bins, chutes or railroad cars. **—The Cleveland Vibrating Co., 2828 Clinton Ave., Cleveland, Ohio.**

THREE-WAY TRUCK HOIST—Claimed to be the first commercial three-way hydraulic truck hoist, the unit can be easily installed on any 1½- or 2-ton truck and convert it into a dump truck that will dump right, left, or off the end. A simple alternative arrangement of pivot hinges enables the truck bed to be dumped any of three ways in a matter of less than 30 sec. Anchor pins placed in position on either side or at the end of the hoist frame let the heavy-duty twin hydraulic cylinders lift the truck bed to dump in a choice of the three positions. The bed can also be locked for rough hauling or shifting loads. It is a self-contained unit, and no welding to the frame is required since the hoist is complete with structural steel stringers and under-bed reinforcing which are easily bolted to the bed and truck frame.—**Norweld, Inc, Loveland, Colo.**

NEW CHAIN FOR CHAIN SAWS—Longer service life and smoother cutting performance result from a new hooded-type chain designed for use on the Disston DA-211 chain saws, according to the manufacturer. These advantages have been achieved by the use of rounded chrome plated cutters and by 9/16-in. pitch. Other desirable features of the new chain are easy sharpening with ¼-in. round file, the self-cleaning design of the teeth which prevent chip clogging, and the rounded rider lug for fast boring. The chain is available in cut lengths of 2, 3, 4, and 5 ft and in 100-ft reels.—**Henry Disston & Sons, Inc., Philadelphia, Pa.**

...For PEAK PERFORMANCE

On Every Job

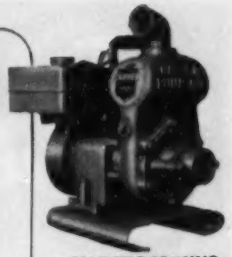
CARVER PUMPS

If you want peak performance on every dewatering job depend on CARVER!

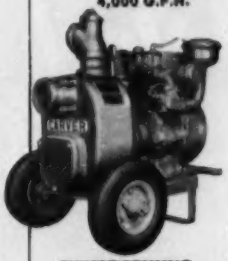
CARVER manufactures the complete line of self-priming pumps from 4000 G.P.H. to 250,000 G.P.H. Every one of these pumps has the same simple design, sturdy construction and rugged durability that mean outstanding performance where jobs are really tough.

Your CARVER DISTRIBUTOR can also supply you with Diaphragm Pumps and a full line of high pressure Jetting Pumps. See him today.

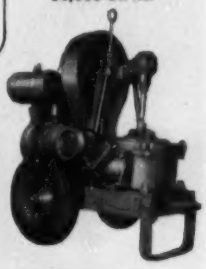
CARVER PUMP CO. 1402 Hershey Ave.
Muscatine, Iowa



1½" SELF-PRIMING
4,000 G.P.H.



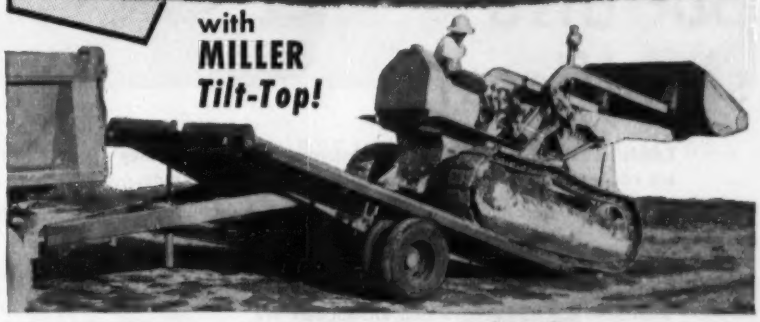
3" SELF-PRIMING
30,000 G.P.H.



4" DIAPHRAGM PUMP
6,000 G.P.H.

CARVER
the quality name in pumps

get MORE PROFIT from men and machines
...cut between-job travel time
with MILLER Tilt-Top!



This big, rugged trailer loads dozers, rollers and other cumbersome equipment in less than two minutes. Ground and platform merge into one surface . . . for the easiest loading of heavy equipment you have ever tried. With Miller Tilt-Top just one man loads . . . is off to the next job, with no lost motion. Miller's faster loading, quick maneuverability provides more time on the job, less time between jobs . . . increases your profit from every operator, every machine every day.

handier
easy-to-back
priced right

Model "B" 10 ton $1175*
Optional equipment (priced extra) 16' long platform (8'x14' standard), hydraulic tilt control, 2 speed hand winch and electric brakes.
*Plus freight and Federal Tax.

MILLER research engineers
Tilt-Top TRAILERS
457 S. 92nd Street, Milwaukee, Wis.

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Company .....
Street .....
Town....., State.....

but also significant

Loads like this have to be handled infrequently but when they are encountered they can't be permitted to stop operations.

If it's an Owen Bucket you can handle such unusual, especially difficult loads without fear of damage to the bucket.

Long experience has taught Owen Engineers where to build in the extra strength in additional material or *special* steel to withstand the abuse to which all buckets are subjected occasionally. That's why they render service for uncommonly long periods with remarkably low repair and maintenance expense.

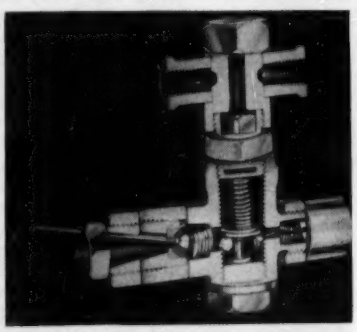
AN ARMFUL AT EVERY GRAB

THE OWEN BUCKET CO.

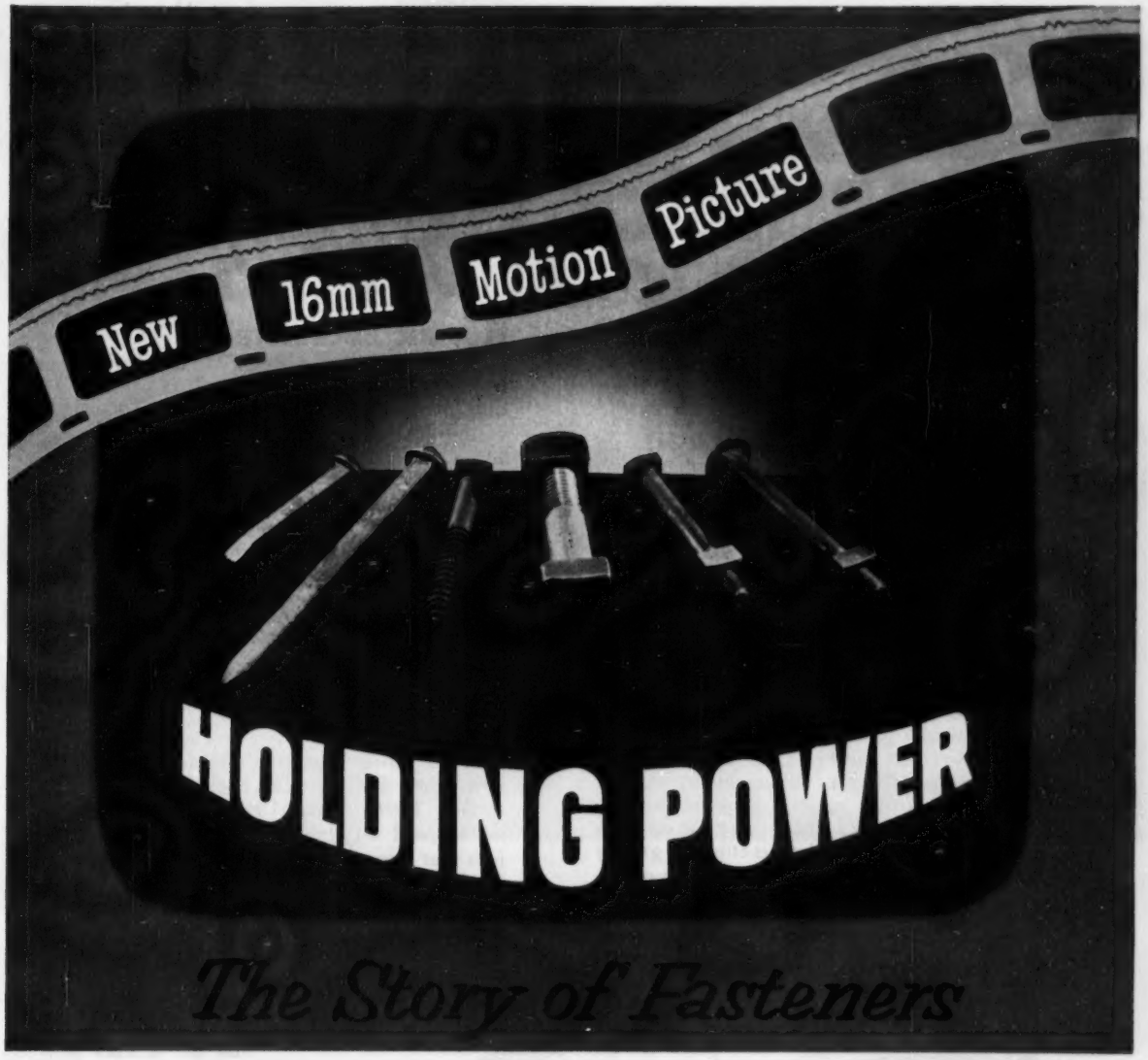
6020 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

PAVING JOINT SEALER—High temperatures created by the exhaust blast of jet turbines, as well as the action of jet fuel spillage, have presented a serious problem in maintaining effectively sealed paving joints in airport runways and aprons. As an answer to this problem, the Presstite Engineering Co.'s Research and Development Laboratories have formulated No. 99, a cold-applied vulcanizing rubber concrete paving joint-sealer compound, which is said to be resistant to jet exhaust blast and fuel spillage. It is furnished in two components, factory packed in correct proportions: (1) a liquid base component consisting of synthetic rubber, suitable plasticizers, vulcanizing agents, activator and inert fillers; and (2) a dry curing component consisting of accelerators with suitable extenders. The mixture is applied cold, eliminating any heating time. It can be quickly mixed and applied at practically atmospheric temperature. Its high bond and extensibility allow it to withstand repeated expansion-contraction cycles of the pavement.—**Presstite Engineering Co., 3798 Chouteau Ave., St. Louis, Mo.**



WOBBLE-ROD AIR VALVE—Offering new possibilities to designers and users of pneumatically operated equipment, the Wobble-Rod Valve, with integral exhaust which incorporates a unique operating principle, is of all-metal construction and has flexibility in both mounting and application. The lever which opens and closes the valve is a hardened rod so swiveled that the free end can move vertically, laterally, diagonally, or in arcs and circles. In addition, the valve can be actuated manually, mechanically, or electrically. Its internal exhaust valve will automatically discharge an air cylinder, line or receiver when the valve closes, but can be eliminated where it is desirable to hold air-line pressures after the valve has completed its job. The valve constructed entirely of noncorrosive metals is said to require no maintenance and has an exceptionally long life. Its range of usefulness is up to 125 psi. Open valve diameter is ¼ in. Over-all dimensions are 3⅛x5x4⅝ in. high. Weight is 2¼ lb.—**Pantex Mfg. Co., 521 Roosevelt Ave., Pawtucket, R. I.**



This important new film dramatizes the story of fasteners. It delves into such common, everyday items as machine bolts, nuts, rivets, track bolts and spikes, and also describes roof bolts, high-strength bolts, oil-well sucker rods, and a wide range of special fasteners. The film takes you behind the scenes in our modern fastener plants. It shows how fasteners are made, and explains the vital part they are playing in industry.

"Holding Power" is in color, with sound. It is on 16mm film, and has a running time of approximately 30 minutes.

"Holding Power" is an ideal film for showing to distributors, consumers, and others closely associated with fasteners. It is also an interesting, highly educational picture for general audiences. There is no charge, except for the return postage. If you would like a print for showing, fill out the coupon, selecting a date well in advance, and mail it to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

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Gentlemen:
Please send me a print of your new film, "Holding Power." I will return it promptly, paying return postage.

Approximate date wanted_____

Send Print to This Address_____

Name of Company or Organization_____

MY-12 Signature_____

Check these Profit making Features of the NEW...

DEMPSTER DIGGSTER® GRD-101

✓ **NEEDS NO WHEEL TRACTION**
Loading of the bucket is accomplished by the exclusive Hydraulic Crowd and Hoist power of the Dempster-Diggster.

✓ **MAXIMUM DUMPING HEIGHT**
This is important because the Dempster-Diggster has the digging height capacity to handle jobs oftentimes expected only of power shovels. The dumping height is 9'6" and the digging height is approximately 15 feet. This enables the Dempster-Diggster to work with high dump equipment.

✓ **TORQUE CONVERTER**
Excavating shovels and front end loaders have to take the abuse and punishment of intermittent jolts. The Dempster-Diggster is constructed and built, not only to accept this at its full value, but to smooth out the sudden jerking and jolting by means of a torque converter. The torque converter is a mechanical feature, but its effect on greater efficiency of the machine and lower operating costs is so great it is one of the important reasons why you want a Dempster-Diggster!

✓ **MINIMUM TURNING RADIUS**
The outside turning radius of the Dempster-Diggster is only 18'3".

✓ **ELECTRIC BUCKET TRIP**
You get a machine with an automatic electric bucket trip for dumping drop bottom digging bucket . . . giving you instant dumping and instant closing of bucket.

✓ **TRUCK-SPEED MOBILITY**
Dempster-Diggster moves from job to job without the use of hauling equipment or can be towed behind a dump truck with the use of a tow bar.

✓ **HYDRAULICALLY STEERED**
Your Dempster-Diggster has positive hydraulic steering booster which is operated by separate, individually driven pumps. Your operator stays fresh, will not tire with this finger-tip steering.

Here's a shovel that won't skim the bank or bottom—but gets a full bucket with every stroke. Here's a shovel that gives you the extra speed on the job and to and from jobs that means extra profits to you! Pound for pound, dollar for dollar, the Dempster-Diggster will out-dig and out-load any other available competing machine in tough going! Let us prove that statement! Write for complete information, including Folder No. 3116.

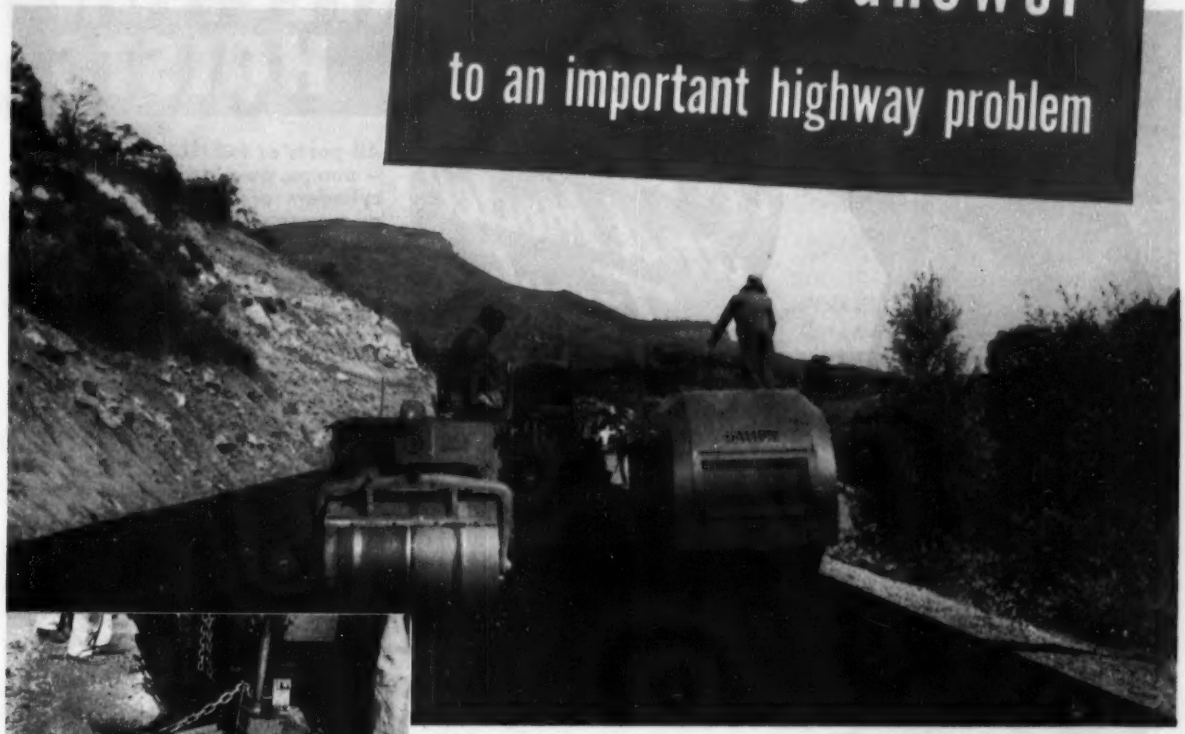
Photo above shows bucket against front of frame in the position which enables Dempster-Diggster to dig 15 inches below grade.

You get a truck payload with a Dempster-Diggster. Note truck is loaded to maximum heaped capacity, yet Dempster-Diggster has ample clearance.

DEMPSTER BROTHERS, 314 Shea Bldg., Knoxville 17, Tennessee

Colorado's answer to an important highway problem

Constructing heavy-duty Texaco Asphaltic Concrete on 11½-miles of US 85-87, from Trinidad, Colo. south to the New Mexico line.



Special device on paving machine forms an asphalt shoulder tapering to a feather edge.

The completed project, constructed by Leone Construction Company, Inc. of Trinidad, under direction of State Resident Engineer A. C. Copeland.

U. S. 85-87 is one of Colorado's main highways. It is used by most Colorado-New Mexico traffic, as well as considerable Colorado-Texas traffic. An 11½-mile section of this route from Trinidad, Colo. to the New Mexico line was a two-lane road with an oil mat surface. The reconstruction of this road last year to meet the demands of today's traffic was featured by the use of heavy-duty hot-mix Texaco Asphaltic Concrete paving and low-cost local aggregate.

The old oil mat was broken up and pulverized, then spread to a width of 33 feet to provide a 3-lane highway. This was topped by a 6-inch sub-base of mine waste, followed by a 2-inch gravel leveling course. The hot-mix Texaco Asphaltic Concrete wearing surface completed the new highway. The compacted thickness of the asphalt top was 3 inches at the outside, decreasing to 2 inches in the center. A special 18-inch beveling device attached to the asphalt paving machine (see photograph) places an asphalt shoulder at each side of the pavement, tapering from 3 inches to a feather edge. This minimizes edge break-off and the hazard attached to moving on and off the pavement.

Texaco Asphalt Cements, Cutback Asphalts and Slow-Curing Asphaltic Oils offer the road builder a wide choice of improvements for highways, streets and airports. These types range from resilient, heavy-duty pavements of asphaltic concrete and sheet asphalt down to a dust layer. Helpful information about all of these types has been incorporated in two illustrated booklets, which you can obtain without obligation by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

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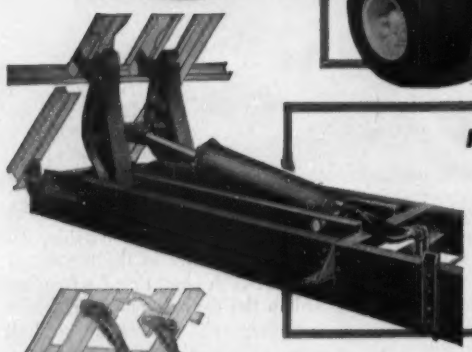
A Complete Line of PERFECTION HOISTS

for every Make and Model Truck

All parts of PERFECTION Hoists — pumps, power take-offs, and cylinders are engineered and guaranteed by PERFECTION. Each part is carefully inter-designed with all other parts, to produce units of exceptional efficiency, power, and dependability.

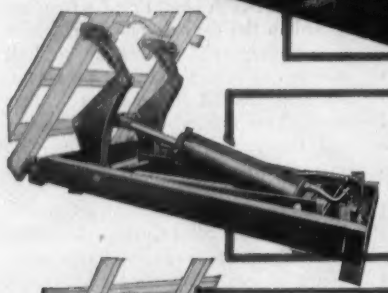
Model 7780 Telescopic

3-stage, telescopic, dual cylinder design provides tremendous lifting capacity with least weight, simple construction, and smooth operation. Direct upward lift is applied at the center of the load. For mounting on trailers with bodies up to 30 cu. yard capacity. Extra heavy-duty service.



Models 727 • 827 • 1027 • 1034 Roll-A-Litt

A constant-low-pressure-type hoist that develops tremendous lifting capacity in relation to its piston displacement. Engineered for those jobs that require a rugged and powerful hoist. Four standard models cover body capacities from 6 to 20 cu. yards. Heavy-duty service.

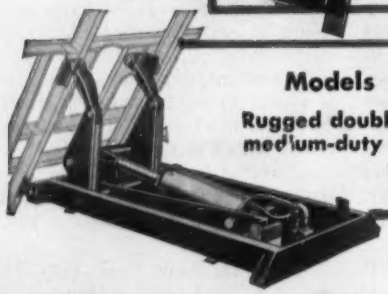


Models 725 • 820 • 825

Compound-type, double lift-arm design, for medium and heavy-duty service. Three standard models for body capacities of 6 and 7 cu. yards.

Models 615B 715B • 720B

Low-mount, double lift-arm hoists for mounting with medium and heavy-duty platform and stake bodies. Three models for bodies from 9 ft. to 16 ft. long.



Models 615 • 715 • 715L • 720

Rugged double lift-arm hoists for light and medium-duty service. Four standard models cover body capacities from 1½ to 6 cu. yards.

Write for Literature Today

THE PERFECTION LINE

TRUCK BODIES and HYDRAULIC HOISTS

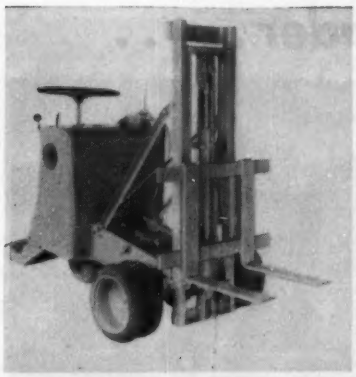
STANDARD and SPECIAL UNITS IN ALL SIZES — FOR ANY USE

Engineered, Manufactured

THE PERFECTION STEEL BODY CO.

and Guaranteed by

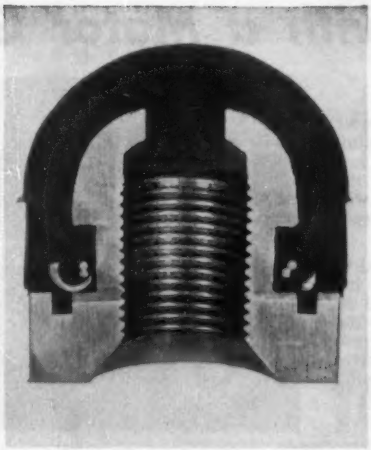
Dept. M-14, Galion, Ohio, U.S.A.



IMPROVED MOTO-BUG — The Moto-Bug, popular power wheelbarrow which is convertible to either a flat-bed truck or fork lift, is now available with a number of new safety and performance features, among them the "dead man" internal expanding-brake system which instantly stops all machine movement when the operator's foot is taken off the treadle. On the fork-lift version, soft core rubber tires for all wheels add to the driver's comfort, while eliminating the possibility of punctures and blowouts. More effiicient transmission of power from the 6-hp gasoline engine to the drive wheels is furnished by a cog-type V-belt of rayon cord construction. Another new feature is a vertical clutch control lever with neutral, forward, and reverse positions. The operator also will like the new height of the steering wheel which is 3 ft, 6 in. above the riding platform on all current models. For more detailed information contact the **Kwik-Mix Co., 3029 W. Concordia Ave., Milwaukee 16, Wis.**

PLASTIC WIRE CONNECTOR—A new screw-on type wire connector with one-piece molded plastic threads and body is available for connections of Nos. 14, 16 and 18 wires. It comes in two sizes, A-1 and A-3. The plastic used has high impact strength, does not absorb moisture and is impervious to most chemicals. The connectors will withstand temperatures up to 400 deg.—**Ideal Industries, Inc., Sycamore, Ill.**

(Advertisement)



TOUGH, LIVE RUBBER molded on Viber replaceable tip prevents vibrator damage to costly forms.

COILED SPRING around steel base firmly anchors rubber molded completely through and around tip.

Replaceable rubber tips save contractors thousands of dollars

• **Progressive contractors save** thousands of dollars by using rubber tipped vibrators to eliminate damage to forms of plywood and other expensive materials. This means longer form life and less cleanup time. Another important saving is longer housing life because the housing is subject to very little wear, and the tip (where most wear occurs) may be replaced when necessary.

Five years of successful field experience have proved that VIBER'S exclusive patented replaceable rubber tips will stand up under rigorous field conditions. As the result of such experiences, leading contractors like the Robert E. McKee Company have standardized on and use rubber tipped vibrators.

VIBER HOUSINGS LAST two to four times longer because of replaceable rubber tip, which screws on end of housing where most wear occurs. Rubber tip vibrators are available from 1-5/16 inch to 3 inch diameter.

• **Simple design** of Viber's patented replaceable tip combines a machined steel base and a molded rubber body. The base, as illustrated above, provides a positive attachment and mechanical interlocking of the two parts. This prevents any possibility of the rubber coming off in the field until it is literally torn and shredded away by reinforcing steel or the abrasive action of the concrete itself

The machined steel base screws directly on the lower end of the housing. It is designed with the same outside diameter as the housing, so the complete assembly is perfectly smooth and will not catch or hang up in the form.

The vibrator does not lose any effectiveness when the rubber finally wears off, since vibration comes from the sides of the housing. Replacement of tip requires only long enough to unscrew the old tip and screw on a new one.

• **These patented replaceable** rubber tips are another example of the progressive design and planning which keeps Viber a leader in the field of vibration. For information on Viber's complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, California. Dept. 68.

VIBER

CONCRETE VIBRATORS SINCE 1931

(Advertisement)

How to Ditch with a Motor Grader . . . . .

1 FIRST PASS or marking cut is made after first setting out ditch line stakes according to the plans. The marking cut should take just a shallow cut similar to that being done by the GALION Grader in photo at right. This will help to maintain accurate alignment on succeeding heavier cuts.

For efficient ditching, blade should be turned to about a 45° angle — with the toe directly behind front wheel. Plane of the blade should be angled enough to form first windrow *inside* the rear wheels. Lean the front wheels away from ditch. With the simplified hydraulic control system on GALION Motor Graders, positioning of blade is quickly and easily accomplished.

2 MAKE ALL REMAINING CUTS count to the utmost. Apply as much pressure to toe of blade as the grader will handle smoothly. After each heavy cut, material should be windrowed towards middle of road — away from the ditching operation. Keep the windrow either inside or outside the rear wheels, otherwise you will reduce traction, efficiency and make uneven cuts trying to operate over the soft, loose windrows of previous cuts.

3 A SLOPING CUT should be given to the back of the ditch after its full depth has been cut. For bank sloping, all tires on ditch side should be in bottom of ditch as shown in photo above. On GALION Graders, versatile positioning of the circle is an outstanding feature. It is easy to shift the circle to right and angle the blade forward so the heel rests at bottom of slope and toe clears top of the slope for a clean, accurate cut.

If the ditch is to have a plain "V" bottom, you now take a finishing pass on the inside slope to remove the material from the bank sloping operation. Bottom photo shows a GALION Grader doing this operation. Note the large front tires which are important to front end stability of the grader on this type of operation — they are STANDARD EQUIPMENT on Galion 118, 104, and 203 Graders.

4 TO CUT A FLAT BOTTOM ditch, as shown in above photo, it is necessary to first cut a "V" ditch on the inside slope. The distance from the bottom of this cut to the bottom of the back slope should equal the required width of the flat bottom. In making the "V" ditch, the blade should be positioned to move the material out to the top of the road.

A flat cut is now made in the bottom of ditch. The complete length of the blade is placed in the ditch — angling the blade forward enough to place the toe at base of back slope, and the heel at base of inside slope. This operation moves the dirt to the inside slope.

5 FINISHING THE SHOULDER is next. One or two final passes are made on the inside slope to move the dirt up onto the road and outside the rear wheels (see photo below). A finishing pass is now made on the shoulder, with the remaining material being spread and windrowed to the center of the road where it can be evenly distributed over the road surface.

6 TO COMPLETE the information you should have on Galion Graders, write The Galion Iron Works & Mfg. Company, Galion, Ohio, or any of their distributors located in principal cities.

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

No Room for Industrial Complacency

Do you believe that American industry is equipped with remarkably up-to-date and efficient machinery? If you do, you are mistaken. The fact is that a large share of American industry's equipment is ancient, of obsolete design and incapable of attaining the efficiency that is made possible by modern production techniques.

This fact is documented by the Seventh Inventory of Metalworking Equipment, just completed by AMERICAN MACHINIST, a McGraw-Hill publication. In brief, AMERICAN MACHINIST shows that:

1. More than half (56%) of American industry's most basic production equipment—machine tools and metal-forming units—is overage, and much of it is so old that it has very limited usefulness.

2. Since Korea, the situation has become dangerously worse.

Facts vs. Plausible Theory

These conclusions contradict the widely-held impression that America's industrial equipment is in better physical shape than ever before. The prevalence of this impression is not surprising. We, as a nation, have spent about $125 billion for new industrial plant and equipment since World War II. That is more than in any previous period in our history. During 1953, American industry invested $21 billion in new plant and equipment, an all-time high. From this, it would be reasonable to infer that our industrial plant and equipment must be in fine condition.

But the facts do not support that inference with respect to the machine tools and other metalworking equipment that are so crucial to our economy in war and peace. Here are the key findings of the AMERICAN MACHINIST Inventory:

(1) More than one million machine tools—out of a total of less than two million in the metalworking industries—are at least ten years old. Many of these, after day and night operation

(Continued on next page)

during the war years and the recent rush to rearm, are actually much older production-wise than their age in years indicates. In most cases, these machines are unable to produce goods as efficiently as modern equipment can, thus needlessly increasing costs.

(2) Almost one out of five machine tools is more than twenty years old. Most of these machines are so outdated by modern standards that they have little more than scrap value. And an even larger portion of our metal-forming equipment (presses, brakes and shears, bending and straightening machines) has passed the 20-year mark and is beyond normal retirement age.

(3) Two out of three machine tools are of designs predating World War II, though many of them have been built since the war. Thus, two-thirds of our machine tools fail to incorporate the many major postwar improvements in design and operating methods.

(4) Never before has outmoded high-cost equipment been so widely diffused throughout American industry. In every one of fifteen major divisions of metalworking production, more than 45% of the machine tools are at least ten years old.

(5) Not since the depression days of the 1930's has the average age of machine tools risen so rapidly as it has in the past four years. Today, 55% are ten years old or older, compared with 43% just before Korea.

Quality vs. Quantity

Why has the condition of our metalworking equipment been steadily deteriorating since the end of World War II? Part of the explanation lies in the fact that, in the immediate postwar years, production of metalworking equipment lagged behind the production of industrial equipment generally. The larger part of the explanation, however, lies in the tremendous postwar expansion of the American economy. This expansion, which has more than doubled our total industrial capacity, has imposed requirements for metalworking machinery that have been met only by more extensive use of old and obsolete tools. In the critically important field of metalworking, the job of providing up-to-date tools is bigger than it ever has been.

There are those who argue that the time has come to cut back investment in new industrial plant and equipment and divert more of the national income into current consumption. They cite both the great increase in the nation's total industrial capacity since World War II and the fact that some industries now have more than ample producing capacity to meet their needs. But this type of calculation leaves out the *efficiency* of that producing capacity.

The AMERICAN MACHINIST Inventory makes it manifest that in the key field of metalworking we are alarmingly short of first-rate, low-cost producing capacity. If we fail to remedy this situation by speeding the replacement of obsolete tools, it will be at the peril of our prosperity, at the peril of a sustained increase in our standard of living and of our national security.

McGraw-Hill Publishing Company, Inc.

By any yardstick—

Transmission Life up 100%

Pulling away from the shovel with 50 tons on its back, this 1LLD Euclid heads for the dumping site at 25 mph. Thirty of these "Eucs," each with two TORQMATIC DRIVES, hauled more than 1,000,000 yards a month for Western Contracting Corporation on the Fort Randall Dam project.

By any yardstick—miles, hours, ton-miles—truck transmissions *last twice as long* for Western Contracting Corporation since switching from direct-drive trucks to units equipped with Allison TORQMATIC DRIVES.

And "Rip" Collins, Project Manager, gives his TORQMATIC Converter-Transmission teams a major share of the credit for his perfect safety record in 1952: *No time lost due to accidents in 740,000 man-hours worked.*

Western's fleet of 30 Model 1LLD Euclids works 20 hours a day, 6 days a week. Making 700-900 trips per shift on a 3-mile round-trip run, these "Eucs" have hauled 6½-million yards of earth in six months' time. They climb 20% grades with 50 tons on their backs.

The TORQMATIC Converter absorbs harmful shock loads, protects drive lines, transmissions, differentials and other truck components. With no clutch pedal to push and only 3 forward speeds—instead of the usual 7 or 10—drivers quick-shift at full throttle and keep their eyes on the road, not on the gearshift.

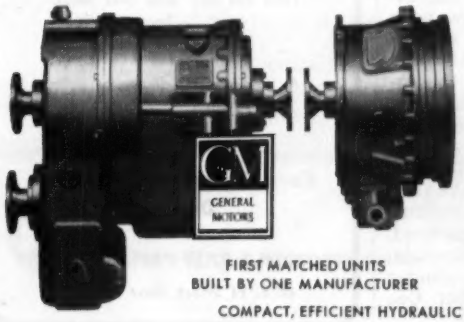
If you are in the earthmoving business, do it better and at less cost with Allison TORQMATIC DRIVES in your units. Ask your equipment dealer, manufacturer or write:

Allison Division of General Motors
Box 894T, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

- **Quick-Shifts** at full throttle with finger-tip hydraulic control
- **Holds power to load** at all times—no clutch pedal to push—no gearshift guess
- **Reduces maintenance costs** by absorbing shock—eliminates engine lugging—prolongs equipment life
- **Only** torque converter-transmission team designed to work as a *unit* and built by one manufacturer
- **Cuts** driver training costs



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Allison

TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS • TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS

A GILDED ERA . . .
A GLORIOUS PAST!

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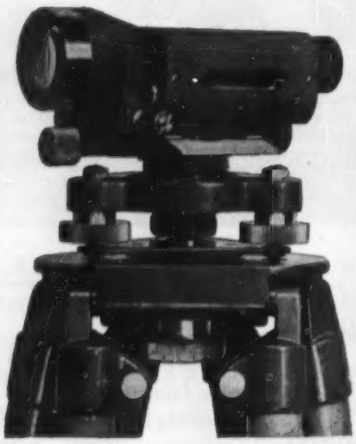

Devoted to a heritage as ancient as Rome . . . dedicated to a precision men have dreamt of . . . Kern instruments bring you the strength of the past . . . the precision of the future!

The NK2 Level

Considered by many the outstanding instrument of its kind, the NK2 small engineer's level offers all the advantages of a coincidence level and tilting screw (without horizontal circle). Offering a working accuracy of ± .7 seconds, it is perfect for technical levelings, length levelings and stadia surveys in flat country.

The model NK2-C gives you your choice of the same instrument with horizontal circle (reading to 1 minute).

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Paul Reinhart Co., Inc.
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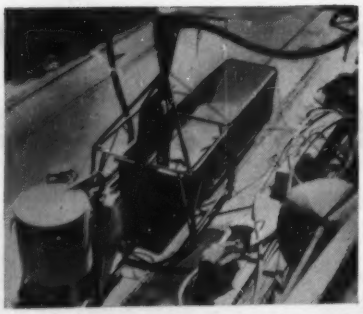
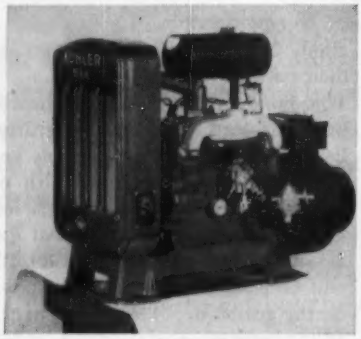


MATERIAL HANDLER—Only one man is needed to operate the Vacu-Veyor, a simple, fully automatic operation which it is claimed eliminates costly bucket and shovel methods. The Vacu-Veyor conveys up to 40,000 lb per hr, which offers fast, efficient and complete removal of all materials even in corners or other hard-to-reach places. Flexible hoses permit reaching around corners and other obstacles. The unit may be moved on casters or truck trailer to any location for direct unloading. It is powered by electricity, gasoline, or diesel engine. The nozzle operates up to 350 ft from the unloader unit, while vacuum and dust collector units can be located an additional 300 ft from the unloading point.—**Vacu-Blast Co., Inc., P. O. Box 885-R, Belmont, Calif.**



NOW KEROSENE-GASOLINE OPERATED—All 2-kw and 3½-kw manually started electric plants have been developed by the Kohler Co. to incorporate the use of kerosene-gasoline operation. The new unit includes a 1¼-gal gasoline tank to provide gasoline for starting the L600 engine, but once the normal operating speed and temperature have been achieved, a simple twist of a two-way valve transfers the fuel supply to kerosene. Before stopping the engine, the valve is turned back to gasoline so that the kerosene in the carburetor and fuel lines can be cleared to permit easier starting for the next operation. To make this engine change necessitated substituting a low-compression cylinder head, special intake and exhaust manifold, and modifications to the cylinder block and carburetor.—**Kohler Co., Kohler, Wis.**

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RESTS ON
A FINGERTIP

Kern AARAU

MODEL 1073

The touch of a fingertip, the infinitesimal difference in instrument balance . . . upon delicate qualities such as these, lies the world wide fame of Kern drawing instruments. Each instrument a gleaming tribute to craftsman and user, Kern drawing instruments represent the culmination of the most exacting traditions in the world.

DROP SPRING BOW

Mechanically perfect and precisely balanced for effortless one hand operation—this Drop Spring Bow is just one more example of Kern imagination and craftsmanship in action.

Write today for our new, fully illustrated catalogue of sets and individual pieces. Model 1073 (as ill.) with case $8.06 less case $6.62

At your nearest dealer, or write direct to:

Kern Drawing Instrument Division

BORDEN & RILEY PAPER COMPANY
60 E. 11 Street, New York City

this man has ice water in his veins!

Of course he'd never volunteer to give blood, anyway. But any resemblance of this old duffer to the average, red-blooded American is a mistake.

For instance, several million healthy Americans have given blood. *But it's not enough.*

So this is to tell several million more Americans that their blood is needed—now!

We've never let anyone down who was in trouble. When a GI gets wounded and suffers *shock*—he's in bad trouble. He's got to have blood and lots of it! Folks here at home need blood too—to save their lives.

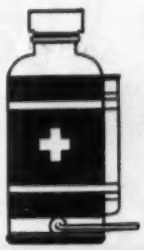
So make a date with your Red Cross, Armed Forces or Community Blood Donor Center. *One* hour and you're on your way.

BUSINESS EXECUTIVES CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLANT BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOODMOBILE MAKE REGULAR VISITS?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

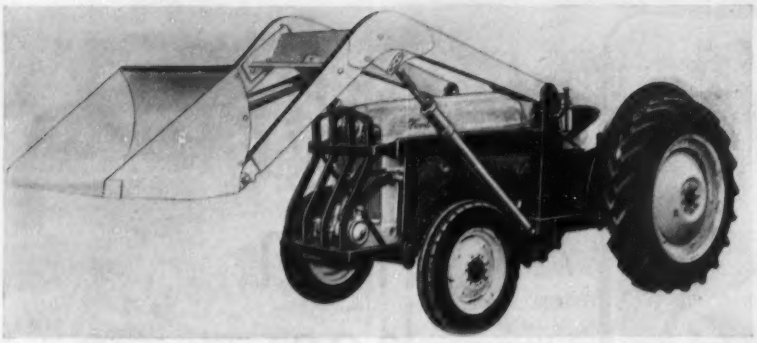
Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . the need for blood is **urgent**!



GIVE BLOOD

...give it again and again

NATIONAL BLOOD PROGRAM

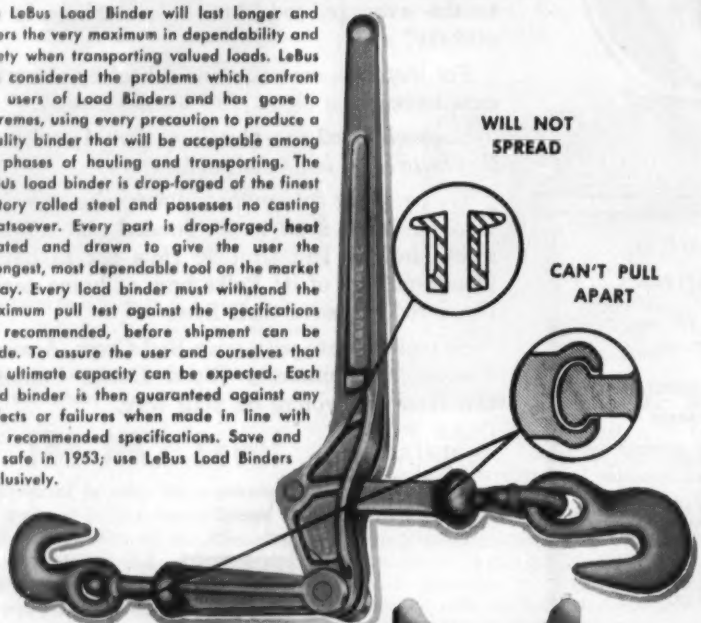


NEW HYDRAULIC LOADER—Only recently available to the construction industry, municipalities, and other industrial users is the new Davis hydraulic loader. According to Charles J. Davis, president of Mid-Western Industries, Inc., the loader has been made available to these industries only after field testing proved that it could withstand the ruggedness required for industrial use. Available with a series of attachments including a concrete buster, material bucket, oversize utility bucket for snow, leaves, etc., and a dozer blade and crane. Another unusual feature: manufacturer issues an unconditional guarantee with it. **—Mid-Western Industries, Inc., 1009 South West St., Wichita, Kan.**

MORE STAMINA

. . . LeBus Load Binders

The LeBus Load Binder will last longer and offers the very maximum in dependability and safety when transporting valued loads. LeBus has considered the problems which confront the users of Load Binders and has gone to extremes, using every precaution to produce a quality binder that will be acceptable among all phases of hauling and transporting. The LeBus load binder is drop-forged of the finest factory rolled steel and possesses no casting whatsoever. Every part is drop-forged, heat treated and drawn to give the user the strongest, most dependable tool on the market today. Every load binder must withstand the maximum pull test against the specifications as recommended, before shipment can be made. To assure the user and ourselves that the ultimate capacity can be expected. Each load binder is then guaranteed against any defects or failures when made in line with the recommended specifications. Save and be safe in 1953; use LeBus Load Binders exclusively.

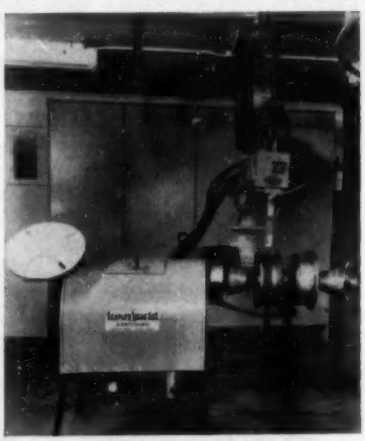


LEBUS ROTARY, TOOL WORKS, Inc.

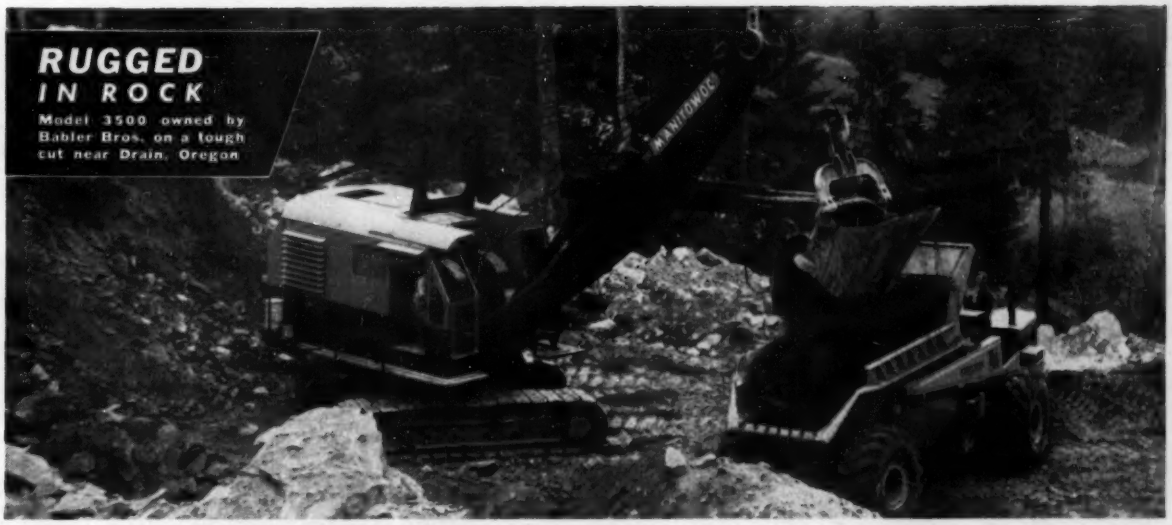
P. O. BOX 2352 • LONGVIEW, TEXAS • PHONE 1232

For more information write for catalog page #100

FASTENING TOOL—The DRIVE-IT Model 410 is a heavy-duty fastening tool which uses specially loaded 38-caliber blank cartridges to drive hardened steel pins with ¼- or ⅜-in. thread or head diameter into concrete or steel. Its design permits driving as many as eight drive pins per min. It features a break-open action at the breech which permits fast loading and automatic cartridge ejection. Additional information and literature may be obtained from the **Powder Power Tool Corp., 7526 S.W. Macadam, Portland 1, Ore.**



AID FOR WELDING JOBS—A low-price welding positioner, easy to operate, and adjustable to handle anything round from 2 in. up, is now available from Turn-A-Weld Products of Portland, Ore. It is adjustable to forty speeds with a foot pedal controlling the on-and-off switch. The Turn-A-Weld features a revolving table adjustable to 60 deg from center and an 8 in. lathe chuck for welding pipe, tubing, etc., of any desired length, and an arbor with tapered cones for welding hubs, wheels, tractor rolls, etc. The unit is portable and comes with a 1-yr warranty.**—Turn-A-Weld Products, Portland, Ore.**



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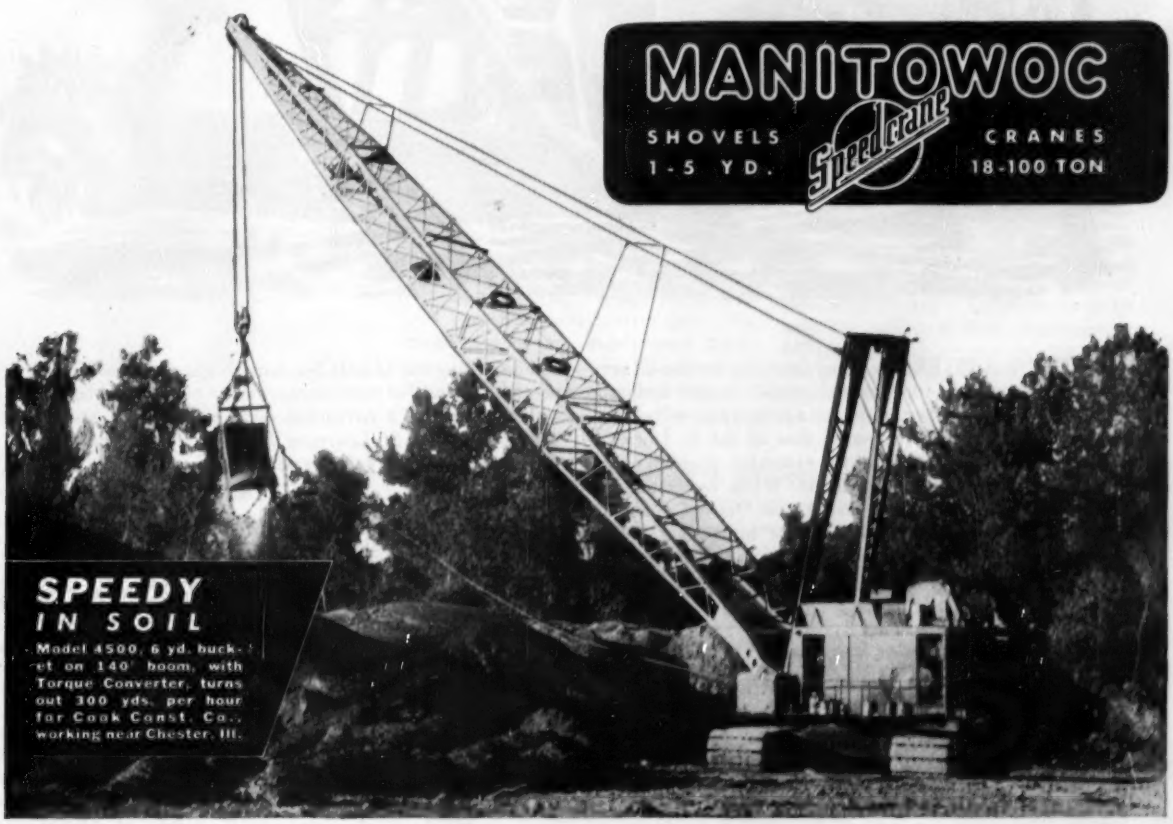
You can bid closer, without worrying about what soils you may encounter, because a Manitowoc takes 'em all in stride — dirt, rock, shale, gumbo, you get real cost cutting, big yardage performance.

Manitowoc's exceptionally rugged construction, fast operating cycles and simplicity of design pay off in more yardage, at lower net cost per yard. Before you bid your next job, remember it's better to bid with a Manitowoc than against it. Write for complete details.

Manitowoc Engineering Corp., Manitowoc, Wis.

MANITOWOC
SHOVELS 1-5 YD.
Speedcrane
CRANES 18-100 TON


SPEEDY
IN SOIL
Model 4500, 6 yd. bucket on 140' boom, with Torque Converter, turns out 300 yds. per hour for Cook Const. Co., working near Chester, Ill.

Moving Day for the St. Lawrence

MOVING A RIVER may sound fantastic, but the Ellicott-designed "Hydro-Quebec," world's largest hydraulic pipe line dredge, has begun work on a project that will eventually divert practically the entire flow of the St. Lawrence River! The project is part of the expansion program of the Quebec Hydro-Electric Commission. When completed, the Commission's installation at Beauharnois, Quebec, will be the largest single-site hydro-electric plant in the world, with electrical output of more than two million horsepower.

Main work of the "Hydro-Quebec" consists of widening and deepening the 15-mile Beauharnois Canal to provide the necessary volume of water to operate the plant. This channel will also serve as a navigation canal which, when tied in with the proposed St. Lawrence Waterway by locks, will permit passage of ocean going vessels.

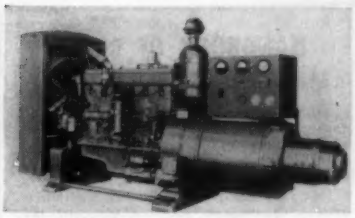
* * *

Whether *your* dredging problem is moving rivers or maintaining irrigation canals, or any of a thousand other projects, Ellicott's 67 years of experience in the engineering, design, manufacture, modernization and operation of dredges can help *you*. For more information about Ellicott dredges and dredging services, write for Catalog 825 to: ELLICOTT MACHINE CORPORATION, 1605 Bush Street, Baltimore 30, Md.

Ellicott Dragon® *Completely New, Highly Versatile* Portable Dredges

These low-cost, standard model Dragon hydraulic dredges are the economical solution for small jobs. They deliver 150-250 cubic yards of solids an hour, pump up to distances of 3,000 feet, and dredge to depths of 20-26 feet. Ideal for work on canals, lakes, harbors and rivers . . . for providing fill for swamps, beaches and dams. For more details, write for new Bulletin No. 826.

ELLICOTT DREDGES



NEW ELECTRIC PLANT—As an addition to its line of gasoline engine-driven electric generating sets, D. W. Onan & Sons, Inc. announces a new 50-kw 62.5-kva electric plant called the Model 50KA, designed for any type of job requiring heavy-duty primary or emergency standby power. It will deliver a fully rated 50,000w at 80% power factor with ample overlad capacity. Powered by an International Harvester gasoline engine delivering 104 hp at 1,800 rpm. The generator is of drip-proof design, direct connected to the engine for permanent self-alignment. It is said to have excellent motor-starting characteristics, with ample overload capacity. Voltage regulation is plus or minus 2%. It is furnished only in the unhoused type.—**D. W. Onan & Sons, Inc., Minneapolis, Minn.**

SALAMANDERS—Two new gas-fired Salamanders are now available to construction and maintenance trades. The Insto-Gas Standard Salamander, Model No. 1405, attaches directly to the top of an Insto-Gas cylinder. The floor-type Salamander, Model 1410, is connected to the cylinder by an Insto-Gas hose. Both units are portable and produce no smoke, soot, grease or ashes. They provide heat for plasterers, carpenters, plumbers and painters during cold weather operations. Because these units produce no monoxide fumes, the salamanders may be used inside buildings.—**Insto-Gas Corp., 1977 E. Woodbridge, Detroit 7, Mich.**

WHEN YOU'VE GOT A MIX on the road, it's not easy to change delivery instructions... *unless* you're equipped to talk to your driver on 2-way radio.

With RCA 2-Way Radio you turn today's headaches into worthwhile profits . . . by maintaining constant contact with all your trucks. To reroute a load fast, you call the driver and give him new instructions. To make use of an undelivered load, your driver calls you for instructions. No wasted mileage, no lost time.

Here is your best bet for more income per truck, more deliveries per hour. It will pay you to look into RCA 2-Way Radio for complete control of deliveries from your office, your car, or your home.

Do it BEST with RCA 2-Way Radio

EASY TO USE as your telephone • **COMPACT**—takes less vehicle space than a spare tire • **TOUGH**—built to take the roughest field conditions • **RELIABLE**—engineered by the leaders in electronics • **PRACTICAL**—local service available from RCA Service Company.

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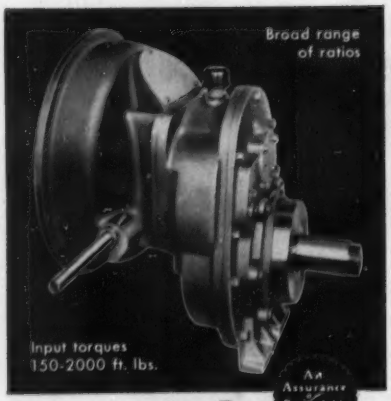

Special heavy-duty

- **Transmissions**
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Cotta Transmission Co., Rockford, Illinois

COTTA HEAVY-DUTY TRANSMISSIONS

"Engineered-to-order"

MORE SAND FOR BIG JOBS-ON THE JOB LESS COST

FEATURES:

Range 60 to 400 mesh

Greater capacity

20% to 30% greater production

More uniform product

Cleaner tailings

Slow speed. Slow wear.

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KINGSTON, N. Y.
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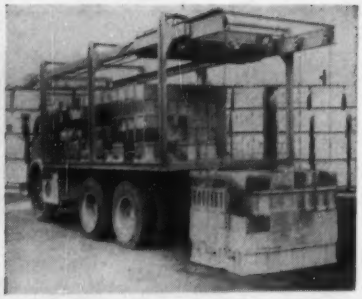
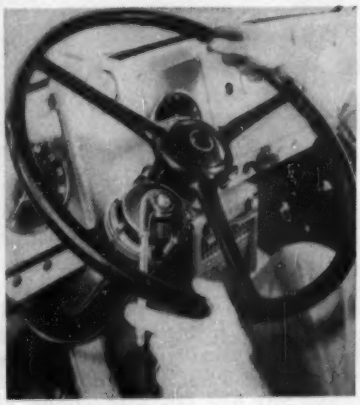


LIFT FOR CONCRETE BLOCK PRODUCERS—Designed for concrete block producers is the Bros Lectro-Lift material-handling truck body. It is claimed this new unit can unload concrete blocks three times faster than a two-man crew working manually. With this rig, one man handles the entire operation. Simple, foolproof carriage hooks extend down from a traveling carriage welded in a structural, heavy-duty steel frame. The lift is powered by a 3-phase generator operated by twin-cylinder air-cooled engine. Available in four models with bed lengths of 12, 14, 16 and 18 ft. An illustrated folder on this unit may be obtained by writing to the **Wm. Bros Boiler & Mfg. Co., Minneapolis 14, Minn.**



STEERING AID—Truck operators can now select the degree of steering assist by means of a new control valve that attaches on a truck steering column. It is operated by a lever extending outward from the valve, permitting the driver to select the degree of steering assistance desired by moving the lever up or down. It is claimed that this device eliminates the possibility of over-steering and results in safer truck operation. The valve controls the operation of the Air-O-Matic Power Steer Booster which is an automatic steering unit powered by compressed air. It is installed between a stationary part of the vehicle and a movable part of the steering linkage. Only one air line is required for installation.—**Air-O-Matic Power Steer Corp., 24 Noble Court, N.W., Cleveland 13, Ohio.**

HANDBOOK OF BRICK MASONRY CONSTRUCTION

Gives a wealth of information useful to all concerned with the estimating and erection of brick masonry work. Describes every kind of work performed by bricklayers and every type of material handled by them. Includes data on manufacture, properties, advantages, etc., of different materials . . . all forms of construction, walls, floors, arches, etc. . . . tables to aid in estimating. **By J. A. Mulligan, Mason Contractor and Builder. 526 pages, 163 illus., $7.00.**

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Discusses 46 different legal problems that arise in construction contracts, showing engineers, architects, contractors, and attorneys the attitude courts have taken toward their problems. Provides cases which are typical of important legal problems involving construction contracts — giving you a compact manual that can help you avoid the legal pitfalls in your work. Shows actual language of contract provisions . . . quotations from court's decisions . . . material facts on each case, etc. **By I. Vernon Werbin, Member, New York Bar. 267 pages, $5.00**

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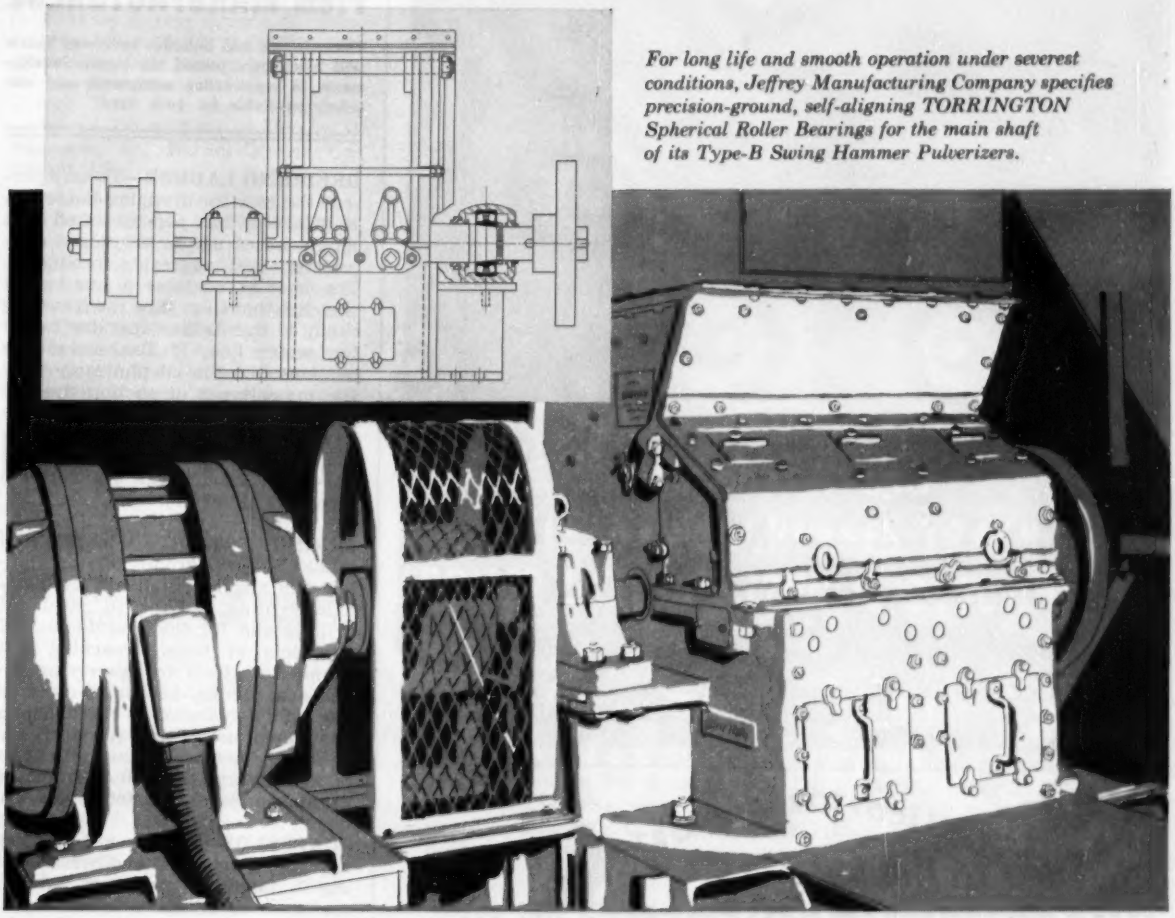
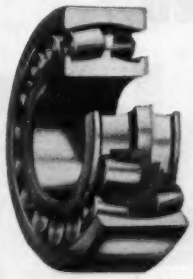


For long life and smooth operation under severest conditions, Jeffrey Manufacturing Company specifies precision-ground, self-aligning TORRINGTON Spherical Roller Bearings for the main shaft of its Type-B Swing Hammer Pulverizers.

With life  to spare

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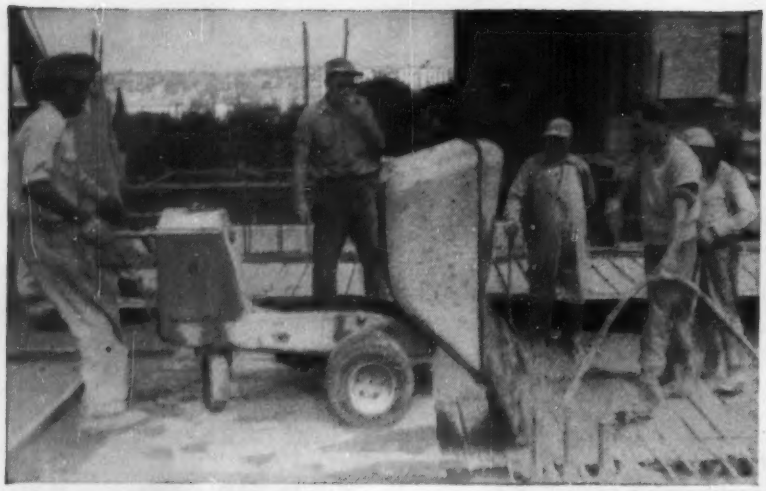

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

DREDGING LADDER—To help present the case for dredging ladders, a 16-p booklet has just appeared that should be of use to engineers, contractors, and aggregate producers. The booklet contains a number of sketches that show how the traveling chain of this ladder operates below the water line. It also includes a number of on-the-job photos showing the many types of suction dredges that are equipped with the Eagle "Swintek" ladder. When writing for this one, ask for a copy of Catalog 83.—**Eagle Iron Works, 212 Holcomb Ave., Des Moines 13, Iowa.**

MINING AND QUARRYING STEELS—Four groups of steel, hollow and auger drill steels for blasthole drilling, solid drill steel for drilling and for the manufacture of a variety of tools, broaching and channeller steels for quarrying dimensional stone, and stone-dressing steels for tools used in the finishing of stone for ornamental purposes, are all covered in this 20-p booklet, copies of which may be obtained from the **Bethlehem Steel Co., Bethlehem, Pa.**

SCAFFOLDS—Here is a 4-p folder explaining the panel and brace locking features of "Advance" tubular scaffolds. It shows illustrations of self-contained cam and stack locks which, it is claimed, permit speedier erection and dismantling of scaffolds by eliminating nuts, bolts, clamps, and other similar time-consuming methods of assembly. This literature can be had from **Advance Scaffold Div., Beaver Art Metal Corp., Ellwood City, Pa.**

HOW TO REDUCE ROAD GLARE—Highway engineers, concrete specialists and consultants, contractors and ready-mix plant operators who are interested in darkening concrete will find a new 6-p brochure just released by the Horn Laboratories of great value. This booklet describes a new solution called AE Dispersed Black, a scientifically formulated carbon black dispersion incorporating a uniform colloidal dispersion and stable tinctorial strength which, it is claimed, will not neutralize or counteract the air-entrainment and which will assure darkened concrete roads with less glare, more safety, and improved appearance. This booklet can be obtained by addressing a request to the **A. C. Horn Co., Inc., 110th St. & 44th Ave., Long Island City 1, N. Y.**

PORTABLE CONVEYOR MOVIE—"Conveyors Only Look Alike" is the title of a new 16-mm sound color film showing the complete line of portable belt conveyors being manufactured by Barber-Greene. Contains an abundance of job shots and profusely illustrates the engineering and structural features of the Barber-Greene line. This movie may be borrowed by writing to **Wayne D. Adamson, Jr., Barber-Greene Co., Aurora, Ill.**

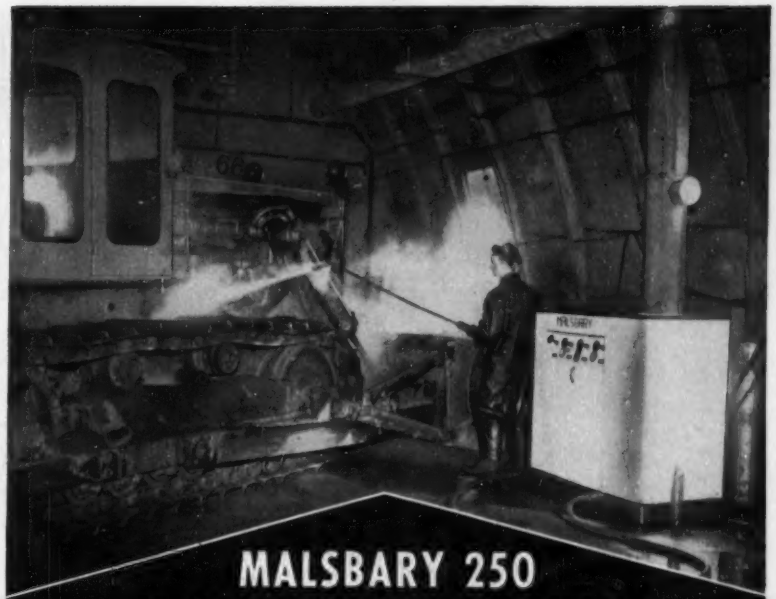
AIR VIBRATION EQUIPMENT—A 16-p catalog (No. 109) describing air vibration equipment shows operating photos of various types of vibrators in use in a wide variety of industries. Also included with this literature is a price list. Ask for this catalog from the **Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland, Ohio.**

GRAVEL PLANT—A series of individual bulletins describing and listing the specifications on the Pioneer Engineering Works bottom deck feed plant for gravel aggregate production is available without charge and may be had from the **Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.**

STAINLESS STEEL FASTENINGS—If you are a user of stainless steel fastenings you will find this new catalog of valuable assistance. It covers such in-stock inventories as cap screws, nuts, washers, machine screws, sheet metal screws, wood screws, set screws, pipe fittings, etc. To obtain this new catalog write to the **Star Stainless Screw Co., 190-A Union Ave., Paterson 2, N. J.**

STORAGE BATTERY SERVICE MANUAL—A third edition of a 44-p storage battery service manual tells how a battery is constructed, how it works, how to make installations, and how to make some battery repairs. Enclose 30c to cover printing and mailing costs when requesting this one.—**Association of American Battery Mfrs., 2706 First National Tower, Akron, Ohio.**

ICE CONTROL—The use of treated abrasives in highway ice-control procedures is described in a new booklet entitled "Calcium Chloride For Ice Control." Points out that the abrasives are often treated with calcium chloride which permits them to remain moist at all temperatures and when they are applied to ice highways they provide immediate traction for motorists. It includes recommended procedures, treating and storage of abrasives, spreading abrasives, direct application of calcium chloride in ice control. This booklet is being distributed by **Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.**



MALSBARY 250 CLEANER INCREASES TRACK ROLLER LIFE from 1200 to 2400 HOURS

Abrasive grease, iron ore and mud cut track roller life to 1200 hours on Mesabi Range operations. Steam vapor cleaners were so slow that preventive cleaning was considered impractical. Then a MALSBARY 250 heavy-duty cleaner took over. Its extremely fast action completely cleans a D8 and dozer in 2 hours, makes it practical to steam clean "crawlers" every 24 hours of service, just before greasing . . . lengthens track roller life to 2400 hours or more! Today more than 15 MALSBARY 250's are cleaning tractors, trucks, drills, etc., on the Mesabi Range.

Try this Quick, Effective MALSBARY Way

Exclusive Patented Pumping System on MALSBARY heavy-duty models delivers 2 to 4 times more pressure than steam vapor cleaners . . . and at temperatures to 325°F. . . . so you can quickly loosen and blast away abrasive, corrosive mud, grease and stubborn road oils from construction rigs; de-gas, heat and clean asphalt tanks; do many jobs other cleaners can't touch. See for yourself—fill in coupon NOW for on-job demonstration.

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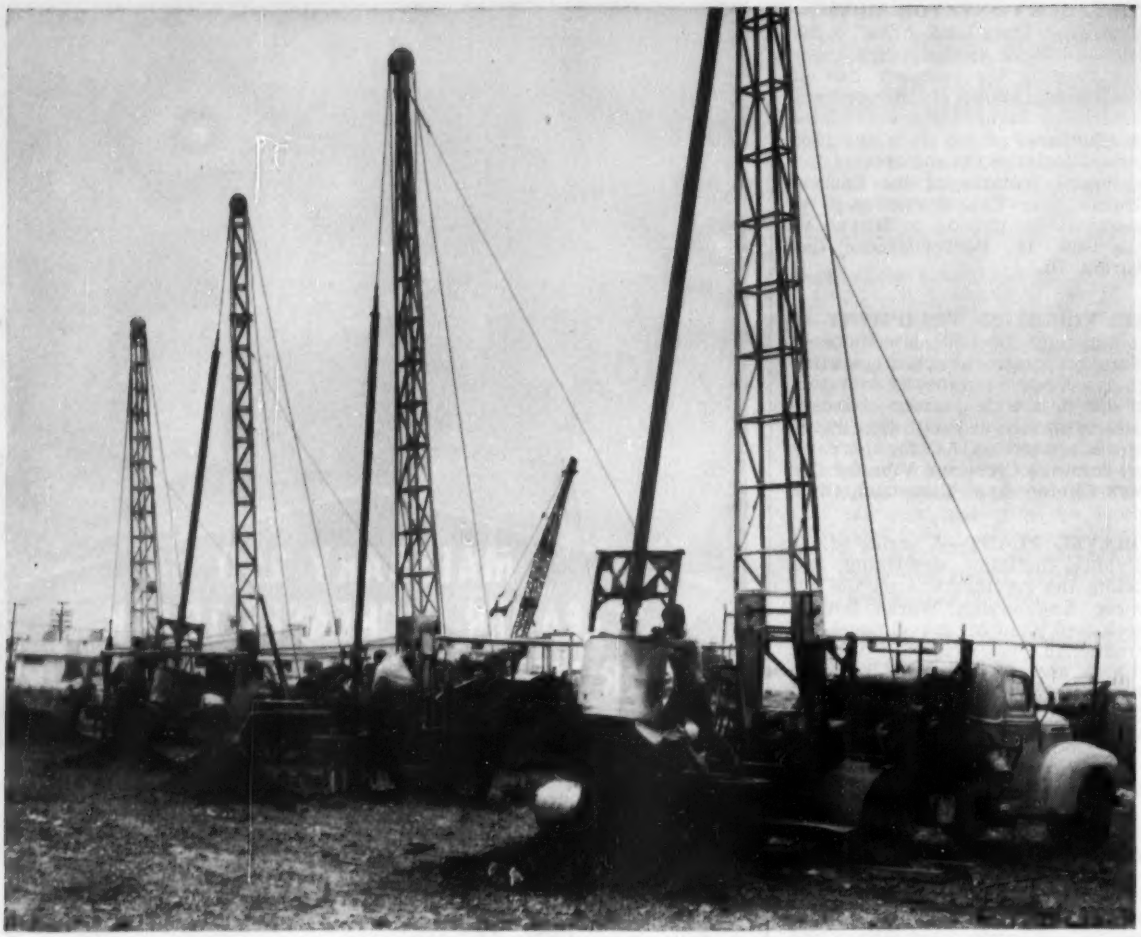


Four 30-in. bucket drills line up abreast as...

Contractor Licks Tough Footing Job

WHEN MacISAAC AND MENKE CO. got the contract to build a $500,000 plant annex for a manufacturer in Vernon, Calif., the first move in preparation for sinking footings to solid ground for the foundation was to experiment with soil conditions at the site. This area was formerly used by a rail transportation company as a source of sand and later had been a dumping ground for all kinds of refuse.

The first attempt to penetrate the layers of debris and reach the sand bed below was made with a 24-in. drill rig. But large chunks of metal and concrete rendered it ineffective.

Next a crane was tried. But the sides crumbled easily and the excavation became too large to use as a footing.

Finally, as knowledge of soil conditions accumulated and the contractors found that the depth of the fill varied from 0 to 32 ft, it was decided to use specially built Calweld 30-in. bucket drills with 35-ft booms mounted on 2½-ton Chevrolet trucks. These rigs, which can excavate up to a 6-ft dia hole, could penetrate to 35 ft, would be large enough to gather up sizable chunks of refuse efficiently. An orange peel would bring up the larger pieces and the regular size bucket would do the rest.

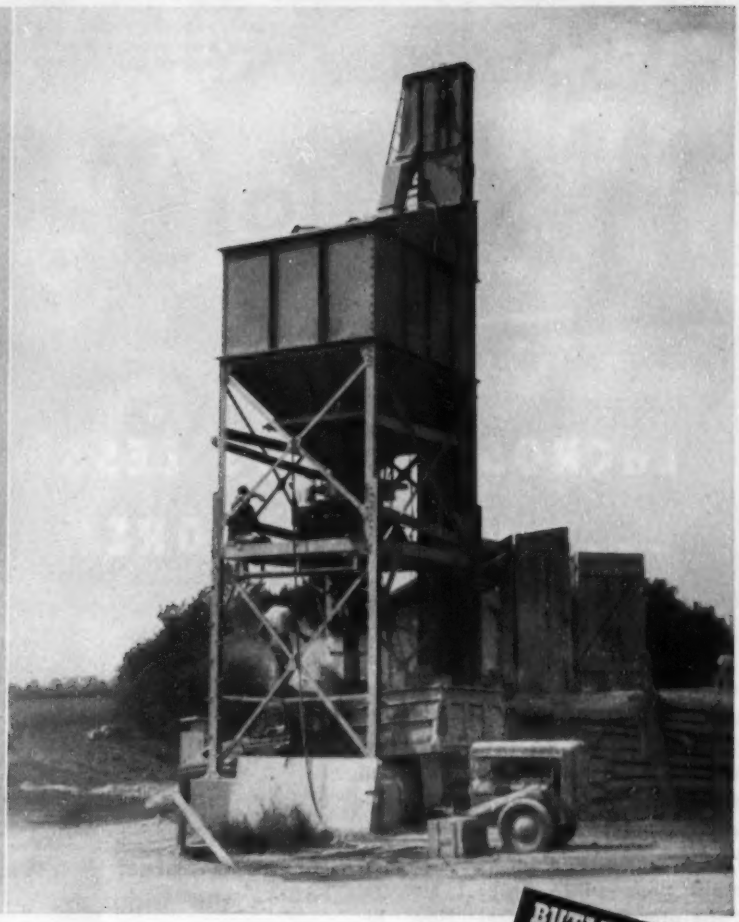
When very large pieces were encountered, a 30-in. steel ring or casing was used to shore up the walls of the hole, enabling a man to go down with an air hammer and break up the material.

In some areas the soil was so loose that cave-ins in several holes developed at various levels. Here a sandy clay soil, imported for the purpose, was tamped into the holes and used as a binding arch to hold the fills in position until the drilling operation was completed and the concrete pour made.

In order to expedite the job, a battery of six drills worked adjacently and simultaneously to make 67 penetrations. As each rig completed its drill of 30 or more ft, water was run into the hole and left overnight. This soaking acted as a binder on the sand at the bottom. The next morning the drills were sent down to bell out the sand bottom and concrete poured immediately from trucks whose arrivals were timed to coincide with the completion of each penetration.

Built in '37

This Veteran Butler Plant Paces Today's Top Paving Production!



BUTLER Cement Batching Plant built in 1937 — still in echelon production.

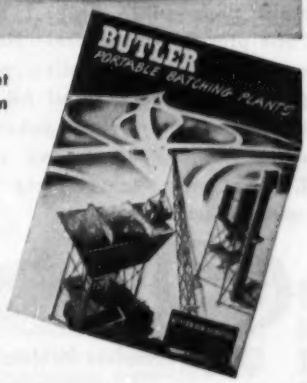
IN 17 years of cement batching, during which the speed of laying a pavement has literally soared, this 1937 BUTLER Plant has met the demand every step of the way.

Now, on a 6½ mile, 4 lane, $4,000,000 Lancaster (Pa.) by-pass the veteran batched for a 34E dual drum paver in laying 122,279 square yards of concrete. The pavement was a 7-inch slab covered with a reinforcing screen and topped with 2 inches more of concrete.

The point is:

in 1937 BUTLER Engineers designed and built plants to match the 1954 demand. And in 1954 BUTLER Engineers are designing and building electronically controlled, automatic batching equipment to meet the production you'll require from now until 1971 — and beyond.

That's why it's just smart business to buy BUTLER.



Have you read this recently published Bulletin on BUTLER Roadbuilders' Plants? Completely illustrated, it shows all of BUTLER standard features and profit-making accessories. BUTLER specializes in portability. Ask for Bulletin 205 to find out how. *Send a postcard today.*

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949 BLACKSTONE AVENUE
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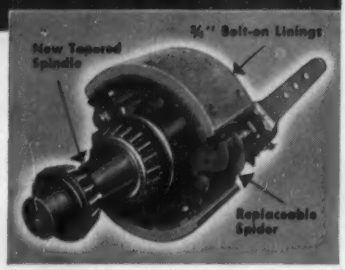
LaCROSSE COSTS LESS ...gives you MORE!

Why *increase* your costs for trailer transportation, when you can get famous LaCrosse dependability at *savings of 5% to 25%* over other leading low beds! And look at all the EXTRA ADVANTAGES you gain with LaCrosse! *Up to 2000 lbs. more PAYLOAD capacity per trailer!* Bigger, more dependable brakes! Stronger "one-piece" gooseneck! New hi-strength tapered spindles, with *replaceable brake spiders!* All this — PLUS new lighter weight spoke wheels, more durable lengthwise decking. Call or write for complete money-saving facts today.



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Husky 12¼" x 6" LaCrosse design, with constant rise S-cam and worm gear slack adjusters, insures cooler running, quicker stops — without slipping or grabbing. Equipped with tough ¾" bolt-on linings which last up to 45% longer than other types — *plus* an exclusive new bolt-on spider which is easily replaced without removing axle assembly.

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ON DECK, DOCK, BARGE OR YARD... ON CONSTRUCTION AND DEMOLITION JOBS...

WHIRLETTES

are "on top of the Job!"

A Deck-Mounted Clyde Whirlette Handles Cargo Without Benefit of Dock Handling Facilities

Here's the Clyde Whirlette, a full-revolving steel derrick with a work capacity that is exceeded only by its versatility! Light enough to be practical as a 'top-side' derrick on multi-story construction . . . rugged enough to handle a ton load at 40' or five ton load at 10' . . . it's engineered to bear with pride the trade-mark of Clyde!

Bronze bushed, steel turntable has a machined double taper roller path on which four wide-faced steel wheels support rotating structure of boom, A-frame and hoist. Two-drum Clyde unit has efficient, single-cone, ball-bearing friction mechanism. Heavy-duty brakes permit full load control at all times.

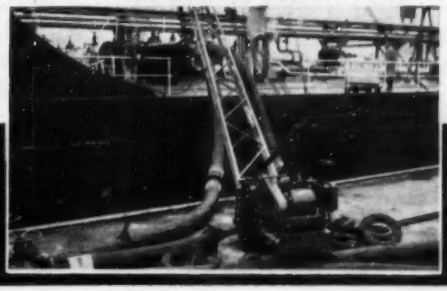
SMOOTH, POSITIVE SWINGING . . .

Friction-disc clutches permit boom to be "inched" or swung a full circle at ¾ to 2½ r.p.m. Single lever controls chain and bevel gear drive and automatically sets brakes when in neutral position. Tail swing of only 5' 6" permits working in congested areas where ground space is at a premium.

Many other important features of Clyde Whirlettes recommend them for a wide variety of material handling problems. Write for Complete Information Today!

Note the Small Amount of Space Needed for This Barge-Mounted Whirlette Handling Structural Steel

Operator Always Faces Load to Have Unrestricted Visibility of Working Area in Yard Served by this Clyde Whirlette.



Handling Bulky Hoses from Pipeline to Tanker is a Simple Task for the Compact Clyde Whirlette.

Self-Contained Whirlette . . . An Ideal Material Handling Unit on Construction or Demolition Jobs.

A Dock-Mounted Whirlette Loads Equipment and Supplies from Dock to Dredging Barges.

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DULUTH MINNESOTA

SUBSIDIARY OF BARIUM STEEL CORP

Ingenuity Overcomes Tough Conditions at Box Canyon Dam Site

The designers of the new Box Canyon Dam in northeastern Washington chose a site on the Pend Oreille River which offered several advantages, but also a serious difficulty. The advantages: minimum clearing of the reservoir, no costly land acquisition rights, no relocations of highway, railroad or transmission lines. The difficulty: a deep scour pocket in the river bed extending through all alternative spillway locations.

The design they developed was ingenious. It consisted of a spillway dam of transverse-arch construction, with the arch resting on an impervious earthfill over the sand pocket, sealed with a 3-in. blanket of concrete. The dam will be anchored to the solid rock abutments of the canyon walls.

Scheduled for completion early in 1955, the dam, a gated structure, will be 260 ft long, 110 ft high from the center of the arch, 80 ft thick at the base, and 43.8 ft wide at the roadway crest. The water it impounds will drive four generators, with a total capacity of 66,000 kw.

In drilling through limestone for the primary diversion tunnel, forebay channel and powerhouse site, access road, and various other drillings, Bethlehem Hollow Drill Steel is being used in major quantities. And—as on so many other tough drilling jobs—giving a bang-up performance!

Wagon drill crews punch into the limestone formation in the forebay channel section of the powerhouse. Six-foot sectional Bethlehem Hollow Drill Steel was used in drilling blast holes averaging 25 ft deep, with some as deep as 60 ft.

Looking up-river at the Box Canyon Dam site. East abutment will be under the railroad bridge on left bank. At right will be the powerhouse and forebay channel, as well as the discharge end of a 220-ft diversion tunnel. Right: Jackhammer men peel a limestone cliff for the powerhouse.

Supervisory Authority for the Box Canyon Dam: Public Utility District No. 1 of Pend Oreille County, Washington. *General contractor:* Pacific-General-Shea, San Francisco. *Sub-contractors (drilling):* Diamond Drill Contracting Co., Spokane; Gibson & Roberts, Spokane; J. N. Pitcher Co., San Francisco; Drill steel supplied by Bitco, Spokane.

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL

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Take a tip

from this $850 tip-over

(A true story based on Company File #61474)

It was a simple enough job—loading our paver for transport. We'd never had trouble before. This time, the paver was part way loaded when the lowboy suddenly skidded on the uneven ground. We watched helplessly! The paver reared up, tipped, and came crashing down. We'd have been stuck for the $850.67 repair bill—except for our Contractors' Equipment Policy.

Suppose the paver had been *your* machine? Would the repair money have come out of *your* pocket?

Not if you were protected by a Contractors' Equipment Policy in the Hartford Fire Insurance Company.

Our policy covers your equipment on the job . . . in transit . . . in storage. It protects you against loss by fire, theft, explosion, collapse of bridges—by collision, overturn, landslide, windstorm and other specific hazards. *Automatically for 45 days* it will cover additional contractors' equipment which you buy.

Don't wait until an accident happens! Call your Hartford Fire Insurance Company Agent or your insurance broker—*now*. Make sure you have cash for your repairs.

Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company • Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company • *Hartford 15, Connecticut*

"4D"

IS THE REASON COMPLETE DOES THE MOST COMPLETE DE-WATERING JOB

It's the simple formula that explains why Complete Well-point Systems de-water successfully when other methods fail. "D" means diameter of the wellpoint. "4D" means that you get 8" drainage on a diameter 4 times the well-point's "COMPLETE".

The [illegible] Complete System gives you this 4-to-1 advantage. As part of the Complete System—or as replacements on your present equipment, no other well-points can equal this Complete satisfaction. Get all the facts.

Send for Catalog ER...today!

COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11TH STREET
LONG ISLAND CITY, N. Y.

COMPLETE WELLPOINT SYSTEMS

FOR SALE OR RENT

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SEARCHLIGHT SECTION

(Classified Advertising)

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CONSTRUCTION Methods and Equipment

E. E. *WEYENETH, Advertising Sales Manager*

HOWARD T. OLSEN, *Business Manager*

Sales Representatives: H. T. Buchanan, 330 W. 42nd St., *New York;* R. H. Larsen, Architects Bldg., 17th and Sansom Sts, *Philadelphia;* F. G. Hudson, Knox Bourne and David J. McGrath, 520 N. Michigan Ave., *Chicago;* R. E. Dorland, 68 Post Street, *San Francisco;* W. C. Bradford, 1510 Hanna Bldg., *Cleveland;* W. E. Donnell, Continental Bldg., *St. Louis;* H. L. Keeler, 1111 Wilshire Blvd., *Los Angeles;* Robert H. Sidur, 1321 Rhodes-Haverty Bldg., *Atlanta;* James Cash, First National Bank Bldg., *Dallas. Other Sales Offices:* 738 Oliver Bldg., *Pittsburgh;* 856 Penobscot Bldg., *Detroit;* 350 Park Square Bldg., *Boston 16;* 95 Farringdon St., *London,* E.C. 4.

WHERE TO BUY

New Armco Prefabricated STEEL BUILDINGS

For Warehouse, Plant, Ofc, Farm Use, etc. (Not Corrugated. Not round.) Galvanized. Steel Sash, Sliding Truck Doors.

Nearly any width length. We or you erect. From $1.70 sq. ft.

Financing Arranged

TRANSAMERICAN CONST. CORP.
BOX 160, SMITHTOWN, N. Y.
SM'th 2-2000

STOP *that* WATER

With FORMULA NO. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. $3 in 55's. Free sample. See Sweet's.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

SEARCHLIGHT SECTION

(Classified Advertising)

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$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line. Positions Wanted undisplayed advertising rate is one-half of above rate, payable in advance.

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The advertising rate is $13.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT—used-surplus

FOR SALE

Used concrete pavers, truck mixers, and pumpcrete. 19 Rector Street, Room 1205, New York City, N. Y. Phone: WHitehall 3-6141.

ENGINEERS—FOREMEN—OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave., Lake Worth, Florida

NEW & USED
PIPE • PILING
DRAINAGE CULVERTS
REINFORCING ROAD MESH
STRUCTURAL SHAPES
COLUMBUS STEEL SUPPLY CO.
Columbus 3, Ohio University 1175

Why waste a shovel on a job like this?

At this Lannon-stone quarry, Lannon, Wis., Minneapolis-Moline RTI Wheelers remove overburden to release expensive shovels for bigger shovel-rated jobs. Result: Wheelers match production, cut operating costs, free shovels to remove heavy stone slabs locked deep in the earth.

With its high-strength construction from radiator to drawbar, front axle conservatively rated at 5000 lbs., greater maneuverability, lower cost per weight and power, the RTI removes spoil at far less cost than would ever be possible with heavier, more expensive equipment.

This is the kind of a job where extra MM quality really pays off. Heaviest industrial-type engines, clutches and transmissions offer continuous-duty operation at full-rated power. The extra weight and rigid single unit design of MM RTI Wheeler loaders permit maximum digging and crowding performance.

If you are using big equipment where the low-cost MM Wheeler could save you money, contact your MM dealer-distributor at once. Let him show you why MM Wheelers just can't be matched for performance, for capacity, for money saved.

MINNEAPOLIS-MOLINE MM MODERN MACHINERY

Whenever you compare MM Wheelers with any industrial tractor, be sure to compare the clutch. The 14" UTIL Wheeler clutch is rated at 640 torque-pounds-feet, while the engine develops 233 torque-pounds-feet at 1060 rpm. This load ratio is typical of the performance reserve you get when you buy a Wheeler.

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

Way up and way out! Rigid construction and extra weight of both 30 hp. RTI and 57 hp. UTIL Wheelers permit solid frame for greater lifting weight, longer dumping reach.

Forget tight spots. With this high-reach, side-dump-loader bucket, you can operate in closest quarters, cut maneuvering to an absolute minimum.

Complete line of loader attachments makes Wheelers pay on every job. The right attachments handle loose, bulk or palletized material with equal economy.

Methods Memo . . .

THE COWS ARE GONE from this dairy barn located near Arden, N. Y., and they definitely won't be back. The structure is being used as a parts and repair depot by H. O. Penn Machinery Co., Caterpillar dealer of New York, Carpenter Diesel, of Highland Falls, and Cummins Engine representatives. The building, located just off the New York Thruway, will be demolished when the earthmoving contractors finish work.

FIFTY YEARS ON TRACKS are being celebrated this year by the Caterpillar Tractor Co. The company will mark this important mile post throughout the year with appropriate national advertising, display materials and gifts through its dealers and complete information and photos for the press describing the evolution of the track-type tractor and earthmoving equipment.

Look for an absorbing article on this interesting history in an early issue of CM&E.

RECENTLY we heard an interesting tale concerning an asphalt plant that's been in use for a number of years, yet is still brand new—hasn't turned out a single pound of blacktop. How come? Seems that a municipality using a lot of bituminous pavement thought that prices asked by local suppliers had climbed too high. When it could not persuade these blacktop producers to lower their quotations to a reasonable figure, the city ordered, paid for, and took delivery on a plant to turn out its own mix.

Before the new plant was fired up, however, the local operators saw the handwriting on the wall and dropped their prices to what the city thought was fair. So the city immediately went back to buying its blacktop from commercial sources. Everyone was happy, or reasonably so: The equipment manufacturer because he sold a plant, the city because it cut the cost of its paving, and the blacktop producers because they kept their market and still made money at the new price.

Thus the city's plant did its work without turning a pugmill. And it's still there, ready to go into production should prices again become unreasonable. Moral: There's no reason for anyone to be greedy.

A TRADEMARK is a useful and common device, but mighty few contractors have made use of one. One of the most interesting we have seen in a long time is the "Kingfisher," symbol of the Fisher Contracting Co., Phoenix, Ariz.

The bird is reproduced in color on decals for equipment, barricades, hardhats and stationery. He has a red chest, greenish-blue body, yellow feet and bill and wears a safety hat. Kingfisher will appear in different poses, doing various phases of construction work in keeping with the equipment on which the decal is placed.

IT IS GOOD to note that more attention is being given to acquaint engineering students with construction—on the operations level. The "putting in place" phase of engineering education too frequently has to be learned in the school of hard knocks, on the job. We were gratified the other day by a message from Arthur Casagrande, Professor in the Division of Applied Science at Harvard University. He had obtained a number of copies of the November 1953 issue of CM&E, distributed them to students in his course on Earthwork and Foundation Engineering and assigned several articles in it as compulsory reading.

AIRPLANES HELP construction in many ways but seldom is it possible for even a small one to land on the job site in the eastern U. S. But one recently landed on a concrete strip laid on the New York Thruway but not yet open to traffic. When a shipment of shovel parts was needed urgently by S. J. Groves & Sons Co., one of the contractors, a small plane brought them from Connecticut. Though there was a landing field only a few miles from the job, the pilot set down on the inviting, unused highway and taxied close to the Groves office. He delivered his parts and took off again across the concrete ribbon.

MERGERS OCCUR among contractors, as well as among manufacturers. A recent one was the acquisition by Turner Construction Co., New York, of an important financial interest in Ferro Concrete Construction Co., Cincinnati. Both firms have a record of large structures and extensive developments erected in the past.

Also, two New York building contractors have joined forces. They are John W. Harris Associates, Inc., and Hegeman-Harris Co., Inc. John W. Harris was elected president of the combine which will headquarter in New York under the latter name.

BIG-COMPANY MANEUVERS continue to make the news as yet another combination is announced. International Harvester Co. and the Heil Co. have an agreement under which Harvester will manufacture and distribute the well-known Heiliners, two-wheel, rubber-tired prime movers used in heavy construction. Heil will keep on manufacturing during an interim period and also will supply matching scrapers and earthmoving wagons.

City Park Garage, Pershing Square, Los Angeles, Calif.; Archt. Stiles Clements, Associated Architects & Engineers; Consltg. Engr.—Murray Erick Associates; Contrs.—Ford J. Twaits Co.; Morrison-Knudsen Co., Inc.; and T-S Construction Engineers, Inc.; 50,000 Cu. Yds. of Pozzolith Ready-Mixed Concrete Supplied by Graham Brothers. All companies of Los Angeles, Calif.

POZZOLITH READY-MIXED CONCRETE In World's Largest Underground Garage

To a long list of outstanding structures built with Pozzolith Ready-Mixed Concrete has been added this 2000-car underground garage.

Use of Pozzolith Concrete assured designed strength . . . also resulted in quicker re-use of slab shoring material — reducing costs and speeding up work; good concrete surface — holding down finishing cost of slabs.

Pozzolith's cement-dispersing, water-reducing and air-entraining action (making available the optimum amount of air) produces these further benefits:

1. Reduced Shrinkage — for less cracking.
2. Lower Permeability — for less "waterproofing". . . later.
3. Increased bond-to-steel — for better construction.
4. Greater Durability — for lower maintenance costs.

Full information and Pozzolith booklet on request.

Over 600 Leading Ready-Mixed Plants Are Producing Pozzolith Ready-Mixed Concrete

CEMENT DISPERSION ALSO KEY TO SUPERIORITY OF THESE MASTER BUILDERS PRODUCTS

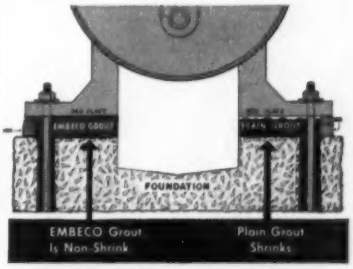
MASTERPLATE . . .

Masterplate produces "iron-clad" concrete floors with 4-6 times longer life; also spark-resistant and static-disseminating. Non-colored and 11 colors. For new floors and resurfacing.

Section of Masterplate Floor. Note Thickness of Armored Surface.

EMBECO . . .

Embeco (1) produces flowable, non-shrink, ductile grout which . . . (2) gives full, level, lasting bedplate contact . . . (3) helps avoid costly shutdowns.



the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

Speeds new Massachusetts pike

. . . with help of TIMKEN® bearings

THERE were 1,500,000 yards of rock to move from this 4½ mile section of cuts on the new Boston to Lowell Turnpike. The whole job was done by this 2-yard Lorain 820-J Shovel and five of its brothers. To keep the shovels on the go with minimum time-out for maintenance and repairs, Timken® tapered roller bearings are used in the six turntable cone rollers, hydraulic coupling, horizontal swing drums, crowd and travel, and hoist drum of these 820-J's.

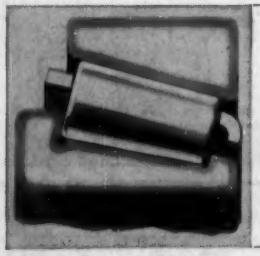
Timken bearings take the tough shock loads because they're case-hardened to give a tough, shock-resistant core and a hard, wear-resistant surface. Their tapered construction enables them to take both radial and thrust loads in any combination. Drums are held in rigid, positive alignment. Wear is minimized.

Because they keep drums and shafts concentric, Timken bearings make closures more effective. Lubricant stays in, rock dust and moisture stay out. Lubrication and maintenance time are held to a minimum.

No other bearing gives you all the advantages you get with Timken tapered roller bearings. Make sure they're part of the equipment you build or buy. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How THEW SHOVEL COMPANY mounts the hoist shaft of its 2-yard Lorain 820-J Shovel on Timken tapered roller bearings for minimum maintenance and long life.



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

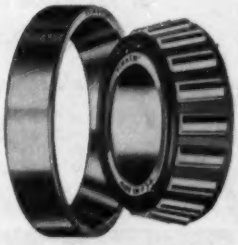
Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION